

Service Manual

General Description

Adjustment Procedures

Block/Schematic Diagrams

Exploded Views/Parts List

Panasonic VHS

Portable Video Cassette Recorder

NV-180<sup>E
EG
B</sup>

AC Adaptor

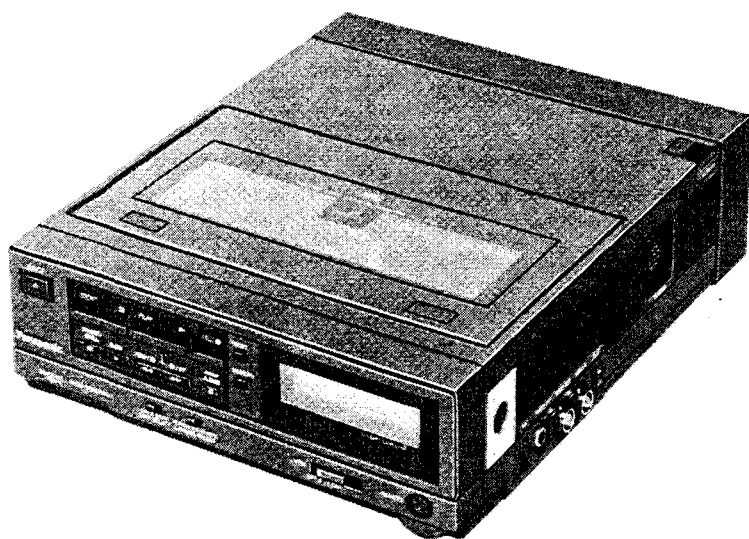
VW-A18<sup>E
B</sup>

Wired Remote Controller

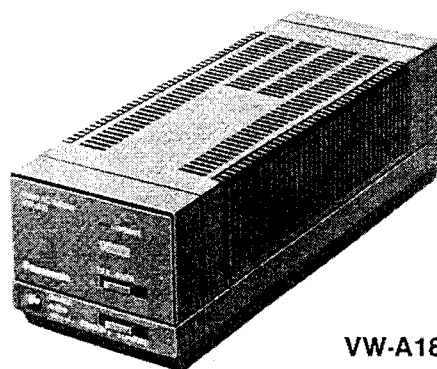
VW-R17E

Plug In AC Adaptor

VW-A11<sup>E
B</sup>



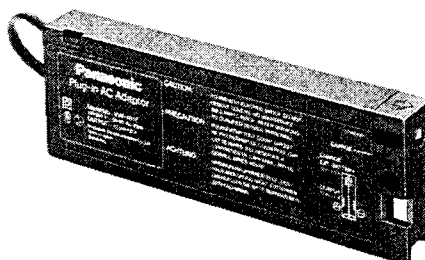
NV-180



VW-A18



VW-R17



VW-A11

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

INTRODUCTION

By implementing a large number of latest technological developments from a wide range of diverse fields, Panasonic succeeded in making this new portable VTR NV-180 a standard in terms of low weight, compact dimensions and overall operation.

This service manual contains these technical information which will allow service technicians to understand and service the Panasonic Portable PAL VHS Video Tape Recorder NV-180, AC Adaptor VW-A18, Plug in AC Adaptor VW-A11 and wired Remote Controller VW-R17. The new NV-180 features a new 2-double-video-head system that allows Super Still, Super Still Advance playback without jitter and distortion and Super Fine Slow Motion with 1/5th of normal playback speed which can even be adjusted between 1/3rd and 1/25th via the remote control unit. Cue & Review, insert, editing, audio dubbing, tape time remaining indicator and Multi-Function Display.

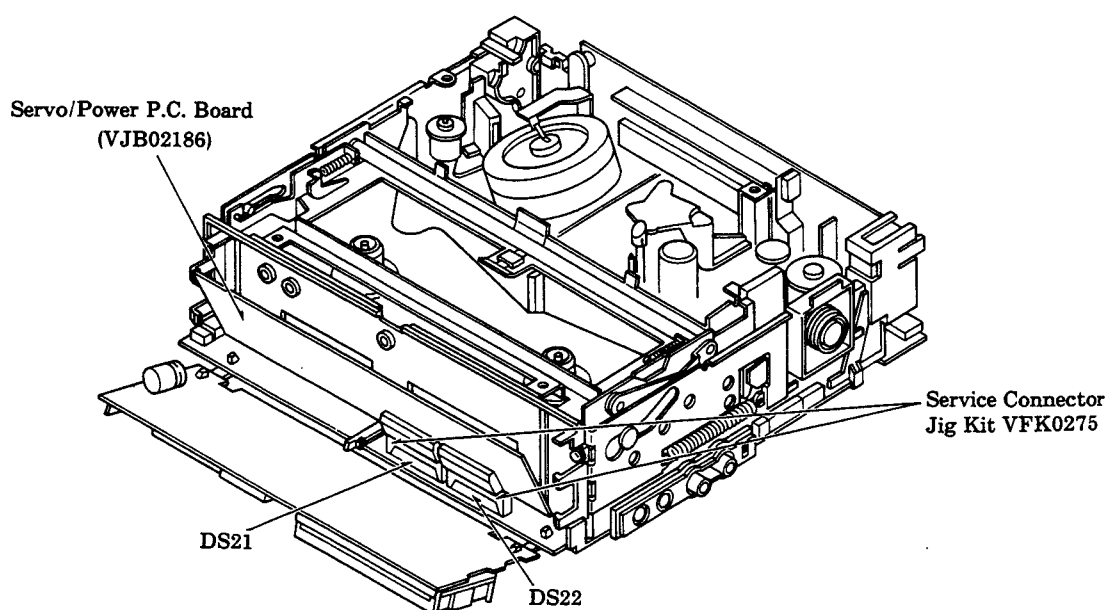
These features in addition to the basic PAL VHS format make the unit an ideal one for your culture and entertainment.

Technical Information

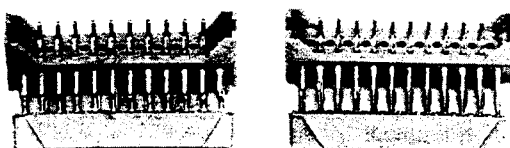
Subject: Service Connector JIG KIT (VFK0275)

We are pleased to inform you that we shall soon introduce the new portable video cassette recorder NV-180 in the market. Regarding this model, this service connector Jig Kit is necessary to check the Servo/Power P.C. board (VJB02186). Therefore, please place an order for this Jig Kit (VFK0275), and distribute this Jig Kit to your local branches and dealers.

* Procedure for use



Connection of Jig Kit (VFK0275)

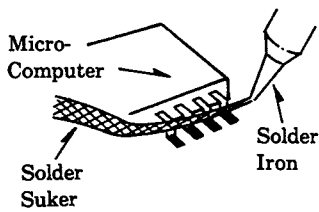
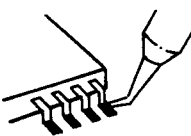
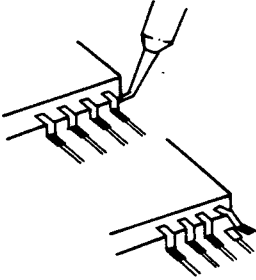
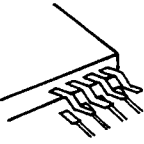


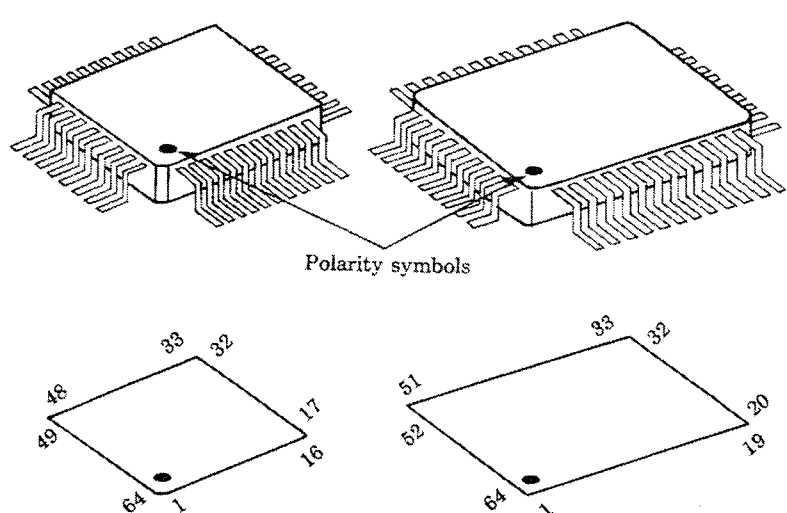
Service Connector Jig Kit (VFK0275)

1. Remove the Servo/Power P.C. board (VJB02186) from Main P.C. board (VJB02184).
 2. Connect the Service Connector Jig Kit (VFK0275) to connector DS21 and DS22 of Main P.C. board.
 3. Reconnect the Servo/Power P.C. board (VJB02186) to Service Connector Jig Kit (VFK0275)
- By using this connector Jig Kit, Servo/Power P.C. board is slanted by 45 degrees.

Subject: Method of replacing the FLAT Package-type Micro-computer

The flat package-type micro-computer has the different form from any of the conventional micro-computers because of smaller size and lighter weight newly provided. The replacing method is described below, which will help you to effectively perform services when replacing it.

Procedures in replacing the flat package-type micro-computer		Precautions
Removal		
Before removing the micro-computer from the P.C. board, absorb the solders deposited on the pins using a clean solder sucker shown in the drawing so that the residual solder will be minimized.	 Micro-Computer Solder Sucker Solder Iron	Use the solder iron (model VFK0248) specified for use with chip parts. Make sure to connect a 240 V-AC transformer (model VFK0249) to the solder iron which is designed for use with 100 V of the AC voltage.
Melt the solder on each pin (an electrode) with the top-end of the solder iron.		To prevent stripping of the printed foil, do not place the solder iron on any pin for a long while.
While the solder is still melted, pull up each pin using the top-end of the solder iron and remove the pin from the foil.		Pull up the pins as fast as possible while the solder is being melted. If the solder is solid, the printed foil may either drop off or be cut.
Repeat these operations in sequentially removing each pin from the foil.		

Installation of a new micro-computer	
First, evenly apply the solder element to the foil surface where the pins must be soldered.	 Polarity symbols
Properly determine the positions of the foil and pins by correctly aligning the polarity symbols, then secure the micro-computer in position.	
Solder all pins to properly connect to the foil.	
Correctly align the positions of these polarity symbols with the coner-cut portion as well as the polarity symbol on the printed circuit board.	

SPECIFICATIONS

Solder Iron: VFK0248

Rate: 100V—15W

Insulation

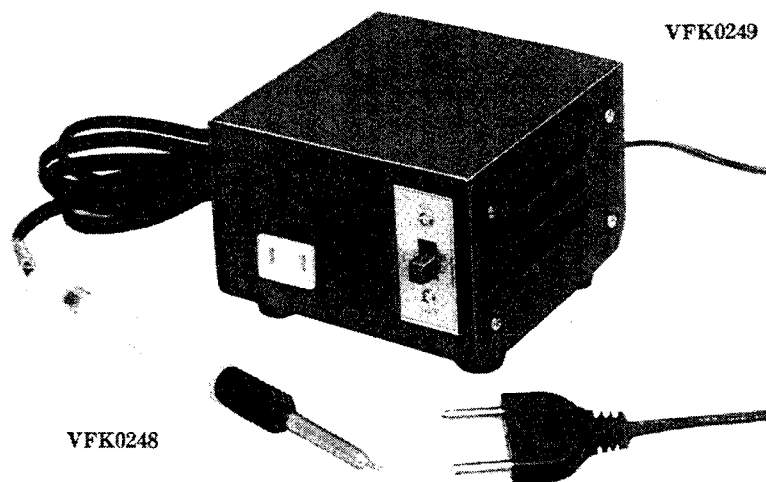
Resistance: 100MΩ

Max. Temp.: 400°C

Transformer: VFK0249

INPUT: 240V AC

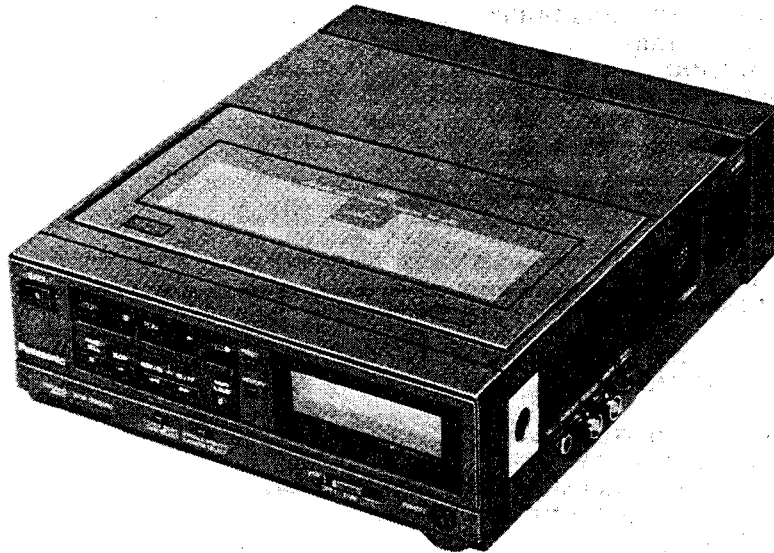
OUTPUT: 100V AC
0.3A



Memo

Portable Video Cassette Recorder

NV-180^{EEG}_B



SPECIFICATIONS

Power Source: DC 12V
 Power Consumption: Approx. 6.8W at Play mode
 Video Recording System: 2 rotary heads, helical scanning system
 Tape Speed: 23.39mm/s
 Tape Format: Tape width 12.7mm high density tape
 Record/Playback Time: 240min. with NV-E240
 FF/REW Time: Less than 5.0min. with NV-E180

VIDEO

Television System: CCIR: 625 lines, 50 fields PAL colour signal
 Modulation System: Luminance: FM azimuth recording
 Colour signal: converted subcarrier phase shift recording
 Input Level: LINE IN (BNC): 1.0Vp-p, 75Ω
 TUNER/CAMERA: 1.0Vp-p, 75Ω
 Output Level: LINE OUT (BNC): 1.0Vp-p, 75Ω terminated
 RF Modulated: UHF channel 36 (±4), 76.0dBμ, 75Ω terminated

AUDIO

Input Level: MIC IN (M3): -70dB, more than 4700Ω terminated
 LINE IN (Phono jack): more than -10dB, 100kΩ (MIC jack+Adaptor) terminated
 TUNER/CAMERA: more than -20dB, 4700Ω terminated
 Output Level: LINE OUT (Phono jack): -8±2dB, 600Ω
 Earphone: -22dB, 200Ω terminated
 Audio Track: 1 track

Video Horizontal

Resolution: more than 240 lines
 Signal-to-Noise Ratio: Video: more than 43dB
 Audio: more than 43dB

Audio Frequency

Response: 80Hz—10kHz

Operating Room

Temperature: 0°C—40°C
 Operating Humidity: 10%—80%
 Weight: 2.7kg (with internal battery pack)
 Dimensions: 215(W)×69.5(H)×263(D)mm
 Standard Accessories: 1 pc. Video Cassette Tape (NV-180E/B only)

2 pcs. DIN-RF coaxial cable
 1 pc. Audio Input Attenuator
 1 pc. Earphone
 1 pc. Carrying Case
 1 pc. Shoulder Belt
 Optional Accessories: Video cassette tape:
 NV-E240 Approx. 344m 240min.
 NV-E180 Approx. 258m 180min.
 NV-E120 Approx. 174m 120min.
 NV-E60 Approx. 88m 60min.
 Battery Pack, VW-VB30EVW-VB31E
 Video Tuner/Timer Adaptor, VW-ET180E/B/EO
 AC Adaptor, VW-A18E/B
 Wireless Remote Controller, VW-R17E
 Wired Remote Controller, VW-R18E
 Plug In AC Adaptor, VW-A11E/B
 Car Battery Cord, VW-AC3E
 Video Camera
 Microphone

Weight and dimensions shown are approximate.
 Specifications are subject to change without notice.

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REMARKS: NV-180EG West Germany model only

This set can be used for special recording/playback of SECAM colour signal.

SECAM tapes which have been recorded on specified SECAM-VHS recorder can be played back in black-white on this set.

SECTION 1

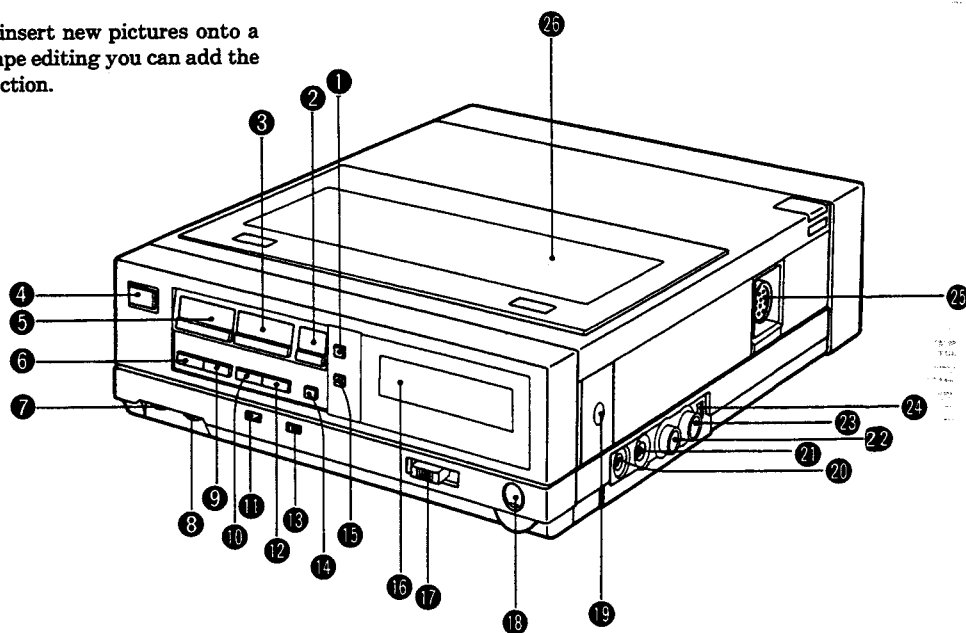
GENERAL DESCRIPTION

1-1. FEATURES

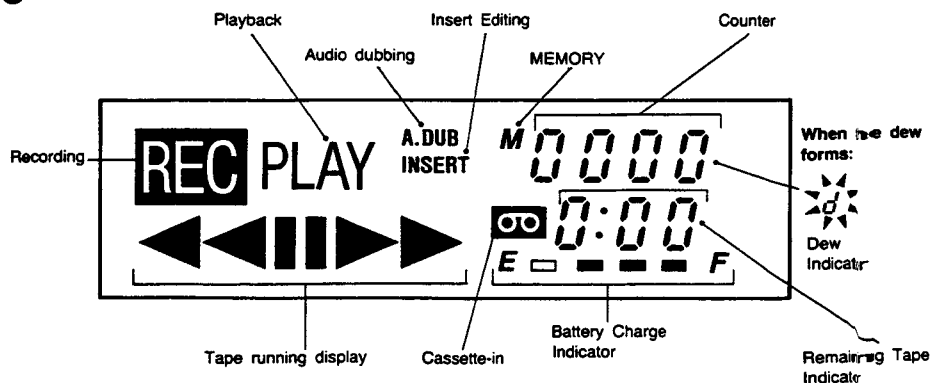
- ① **Compact, Lightweight and Portable**
This portable **VHS** VTR is tremendously versatile in recording with a camera, and very light in weight—only 2.3kg excluding a battery.
- ② **Multi-Function Display**
Whenever an operation button is pressed, the activated function is immediately indicated on this easy-to-see Multi-Function Display. It shows you at a glance, in what operation mode the VTR is.
- ③ **Three-Way Power Operation**
You can operate the VTR and camera by using three power sources:
Battery pack, AC adaptor, or car battery cord (all optional).
- ④ **Multi-Motion Playback**
In addition to normal playback, you can quickly review and cue recorded tapes as well as enjoy super still, super still advance, and super fine slow-motion viewing.
- ⑤ **Insert Editing**
The Insert Editing allows you to insert new pictures onto a pre-recorded tape. To complete tape editing you can add the sound with the audio dubbing function.

1-2. CONTROLS & COMPONENTS

- ① **Reset Button**
Push the reset button to reset the Counter of Multi-Function Display to "0000".
- ② **Record Button**
Push together with Play Button to start recording.
- ③ **Play Button**
Push to play back a recorded tape.
- ④ **Eject Button**
Press this button to remove the cassette.
- ⑤ **Stop Button**
Push to stop the tape.
- ⑥ **Pause/Still Button**
Push to temporarily stop the tape during recording in order to avoid recording unwanted material, or to view a paused picture during playback. Push again to release the tape from pause.



①⑥ Multi-Function Display



7 Tracking Control



Noise Picture

Tape recorded on another machine show noise or a streaky playback picture, rotate this control slowly in either direction until the picture is clear. The control should normally be kept in the "FIX" position.

8 Slow Tracking Control

When noise appears during multi-motion playback (still-frame, super still advance, or super fine slow-motion), activate the slow playback mode and turn the Slow Tracking Control clockwise or counterclockwise to reduce the noise.

- During multi-motion playback using tapes recorded on other VTR the Slow Tracking Control may not significantly reduce noise.
- Multi-motion playback may cause some distortion in the upper parts of the picture, but this is normal and does not indicate a trouble.
- When the picture rolls vertically, adjust the TV's vertical hold control.

9 Slow Button

Press SLOW Button during playback, and the super fine slow picture will be played back at 1/5 that of normal playback speed.

For normal playback, press PLAY Button again. If super fine slow-motion playback continues for more than 10 minutes, the VTR will automatically stop.

10 Rewind/Review Button

Push to rewind the tape.

When this button is pressed during playback, the picture can be scanned in reverse at 7 times normal speed. Review will continue as long as the button is depressed.

11 Cassette Selector

To see the remaining tape time in the Multi-Function Display as follows.

- "E240".....For NV-E240 cassette tape
- "- E180"....For all other cassette tape

12 Fast Forward/Cue Button

Push to fast-forward wind the tape.

When this button is pressed during playback, the picture can be scanned will play back at 7 times normal speed. Cueing will continue as long as the button is depressed.

13 Camera Select Switch

When camera recording, this switch must be set to REMOTE. Set it to NORMAL at the other cases.

14 Audio Dubbing Button

When this button is pressed simultaneously with the Play Button during playback, sound from another source can be recorded on the tape in place of the original sound. (The original sound will be erased.)

15 Memory Button

When this switch is turned on, the tape will automatically stop rewinding just the portion where the Tape Counter was previously set to "0000".

- The tape will not stop at this point during review playback.

16 Multi-Function Display

17 VTR ON/OFF Switch

This switch is used to turn the VTR deck on and off.

18 Remote Control Socket

For connecting the Wired Remote Control Unit.

19 Shoulder Strap Holder

Connect the Shoulder Strap to the Holder.

20 Microphone Input Socket

For Connecting an Audio Input Attenuator (included). This is useful for recording and audio dubbing.

21 Audio Output Socket

For connecting an audio cable of a TV monitor, a component audio system, or another VTR.

22 Video Output Socket

For connection to a TV monitor or another Video Cassette Recorder. Not used with an ordinary TV.

23 Video Input Socket

For connecting the video cable of a video camera or an output video signal of another VTR.

24 RF OUT/LIGHT Switch

When using the Battery Pack or the Plug-in AC Adaptor, set this switch to "ON" to monitor through the RF OUT Socket during recording. If set to "ON", the Multi-Function Display is lit.

25 Camera Input Socket

For connection of a portable video camera.

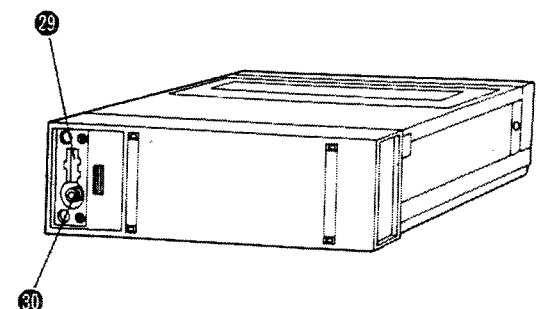
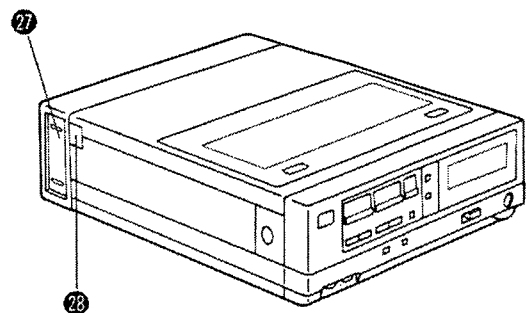
26 Cassette Holder

27 Battery Compartment

28 Battery Eject Button

29 Adaptor Socket

30 RF Output Socket



SECTION 2

ADJUSTMENT PROCEDURES

2-1. MECHANICAL ADJUSTMENT PROCEDURES

The model NV-180 uses the FT Mechanical Chassis. Therefore, please refer to the Service Manual FT chassis (Order No. VRD-8405-529) for main mechanical adjustments.

2-1-1. DISASSEMBLY FLOWCHART

This flowchart indicates disassembly steps of the cabinet parts and the P.C. Boards in order to find the items necessary for servicing.

When reassembling, perform the steps in the reverse order. The bottom plate can be removed individually.

Note:

1. When removing the cabinet, work with care so as not to break the locking portions.

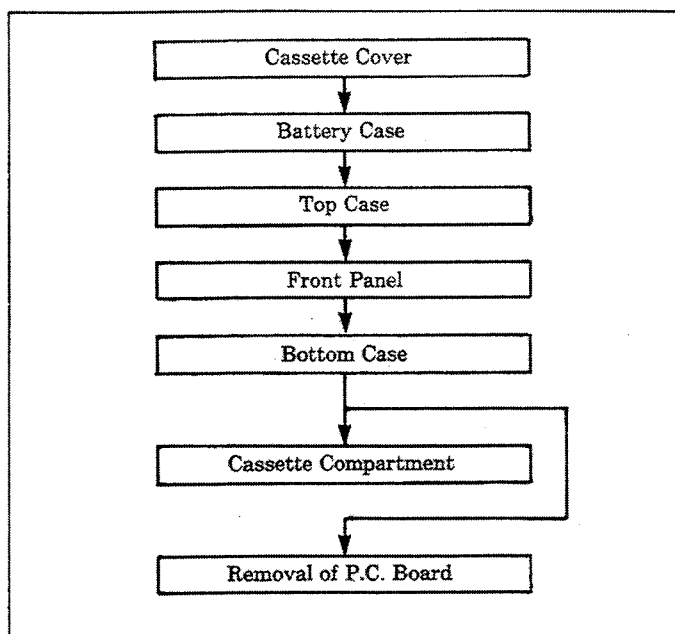


Fig. 1 Disassembly Flowchart

2-1-2. DISASSEMBLY METHOD

Notes:

- a. Place the cloth or any other soft materials under the P.C. Boards or deck for preventing them being damaged while servicing.
- b. When reinstalling, ensure the connectors are connected and any electrical components are not damaged.
- c. Do not supply power to the deck during working except removal of the cassette cover.

1. Removal of the Cassette Cover

Supply power to the deck and turn it on. Then press the EJECT button to raise the cassette up holder. Remove 2 rubber covers and 2 screws (A). Then carefully lift and pivot the front portion to remove. Pay attention so as not to damage the locking portions (B).

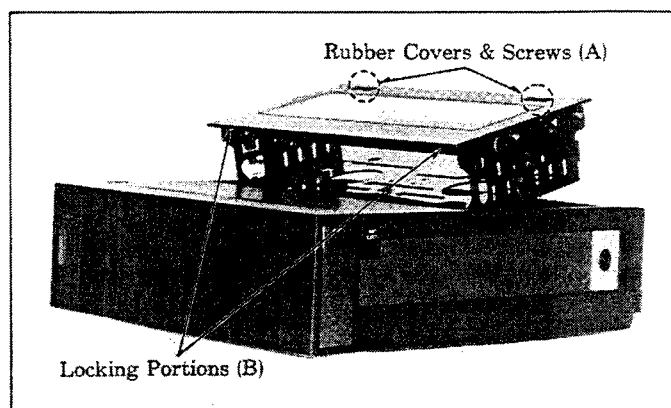


Fig. 2 Removal of the Cassette Cover

Note:

When reinstalling, first lock the locking portions (B).

2. Removal of Battery Case

- (1) First confirm that the battery is not inside the battery compartment. If it is, remove the battery.
- (2) Place the deck upside down so the bottom case faces upward.
- (3) Remove 2 screws (C), and hold both right and left ends of the battery case. Then carefully lift and pivot the top portion of the battery case.

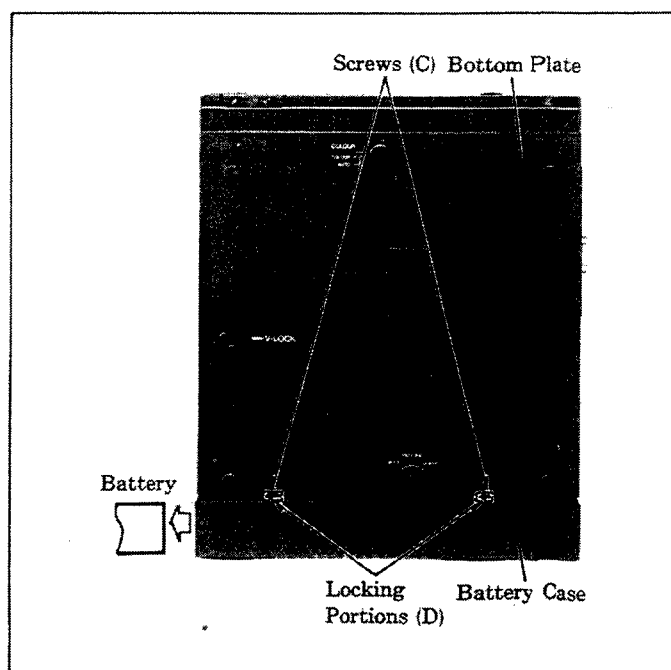


Fig. 3 Removal of the Battery

Note:

When reinstalling, first insert the locking portions (D) into the slot of the top case.

3. Removal of the Top Case

- (1) Remove the 2 screws (E) on the front panel.
- (2) Remove the 4 screws (F) on the top case. Then remove the top case by lifting the rear portion and pay attention so as not to damage the locking portions (G).

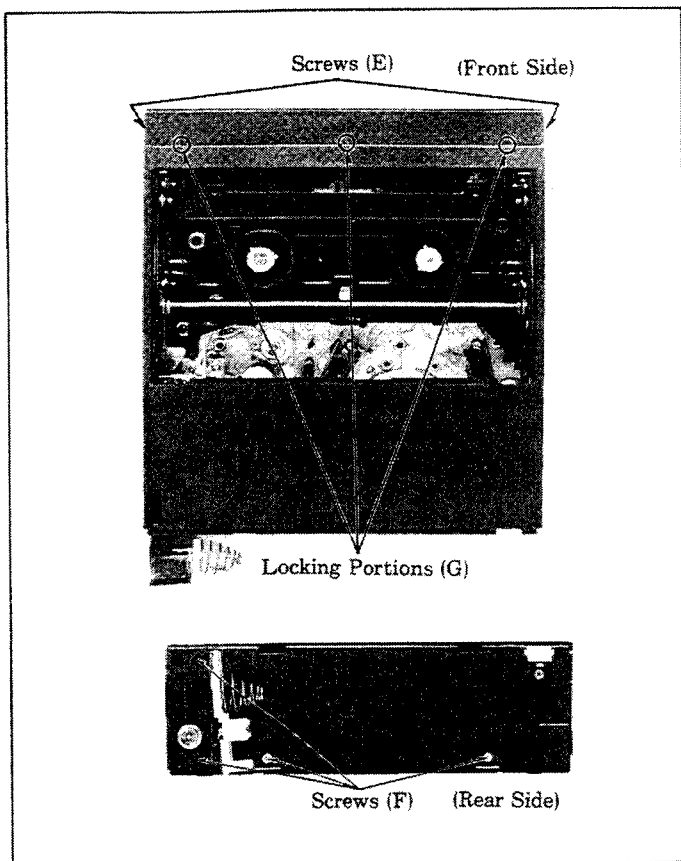


Fig. 4 Removal of the Top Case

Note:

When reinstalling, first insert the locking portions (G) into the projection of the front panel.

4. Removal of the Front Panel

- (1) Unlock a locking tab (H) and hold both right and left ends of the front panel, then carefully pivot the top portion to unlock the locking portions (I) and remove it.

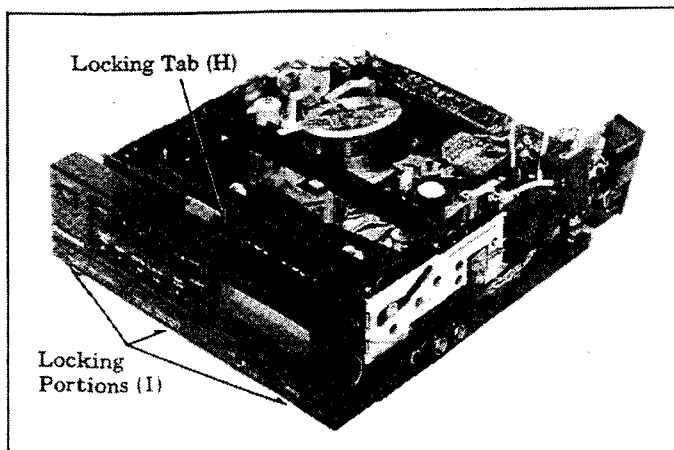


Fig. 5 Removal of the Front Panel-(1)

- (2) Pull the portion (P) of the connector FS63 and disconnect a flexible connector FS63, and remove the front panel.

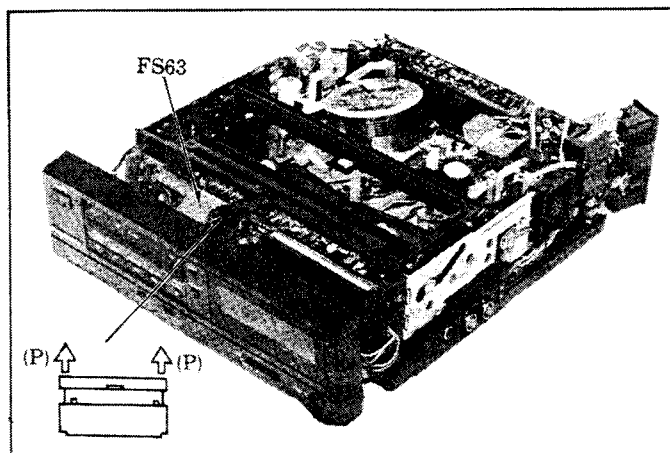


Fig. 6 Removal of the Front Panel-(2)

Note:

When reinstalling, first connect the connector and insert the locking portions (I) to the slot of the Bottom Case.

5. Removal of the Bottom Case

- (1) Place the deck upside down so the bottom case faces upward.
- (2) Remove 3 screws (J). Then remove the bottom case.

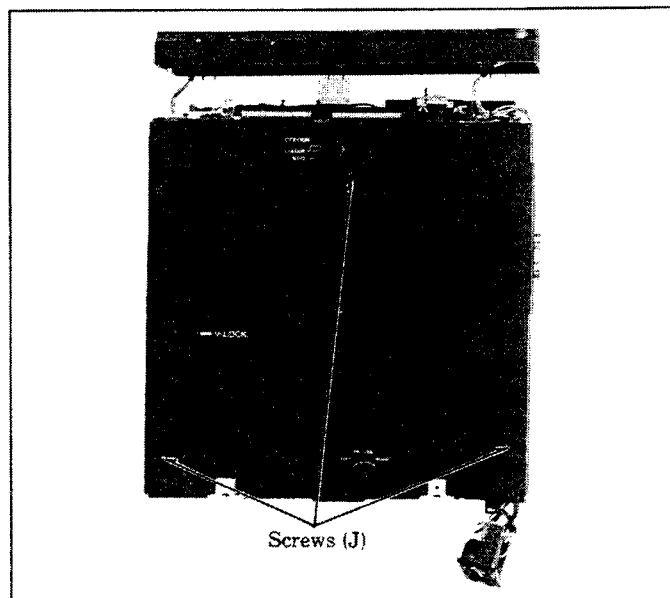


Fig. 7 Removal of the Bottom Case

6. Removal of the Cassette Compartment

- (1) Remove 2 screws (K) and remove 5 screws (L) on the chassis.
- (2) Eject the cassette up holder and disconnect a connector P218. Then remove the cassette up holder by lifting the front portion.

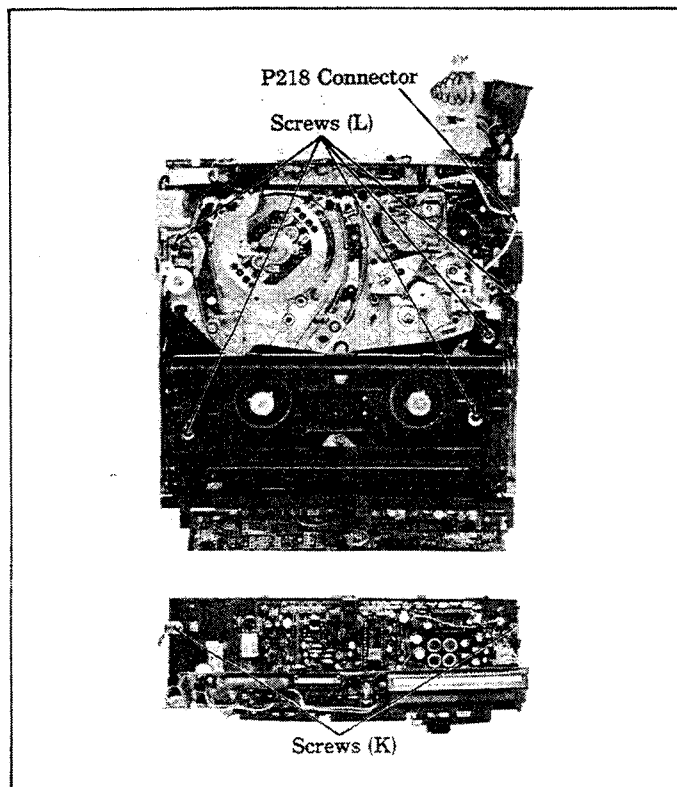


Fig. 8 Removal of the Cassette Compartment-(1)

- (3) Remove the supply photo TR unit, removing a screw (M).

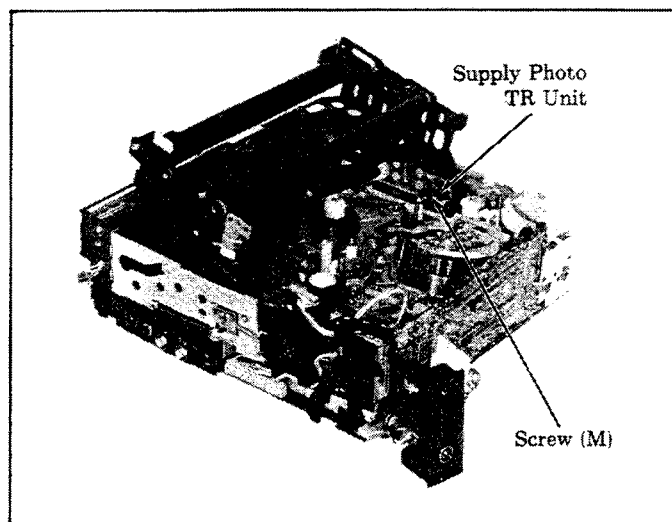


Fig. 9 Removal of the Cassette Compartment-(2)

Note:

When reinstalling, first insert the back portion of the cassette compartment.

- (4) If you want to eject the cassette compartment having a cassette tape without the electrical power, push (N) portion of the cassette lock lever, inside of Mechanical Chassis with small screwdriver.

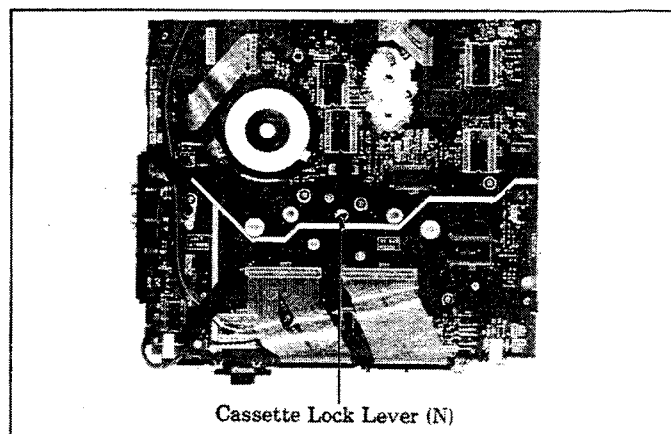


Fig. 10 Removal of the Cassette Compartment-(3)

7. Removal of the Luminance/Chrominance & Audio C. Board

- (1) Remove 2 screws (O).
- (2) Disconnect 2 direct connectors P33 and P34.
- (3) Remove a shield case and disconnect 2 connectors P41 and P32.

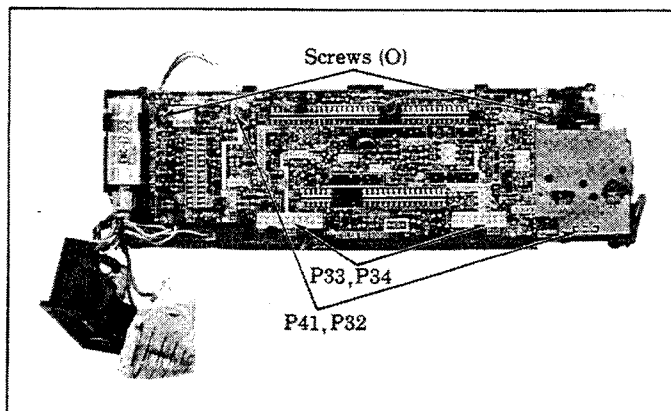


Fig. 11 Removal of the Luminance/Chrominance & Audio C. Board

Note:

Do not damage the Fine Integrated Circuit during removal of the Luminance/Chrominance & Audio C. Board.

8. Removal of the Key Board Unit

- (1) Pull the (P) portion. Then disconnect the flexible connector FS63.

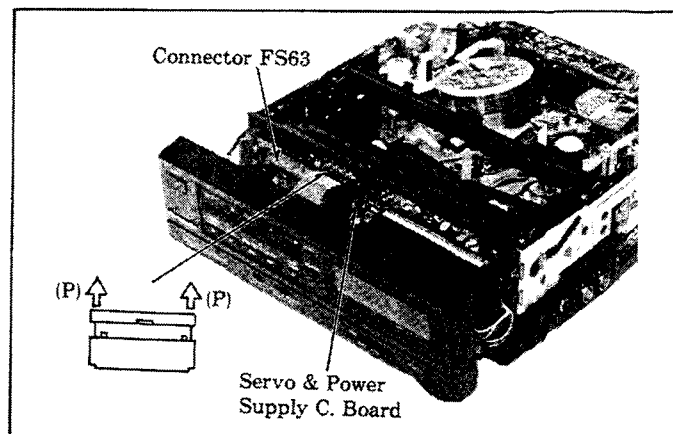


Fig. 12 Removal of the Key Board Unit-(1)

- (2) Unscrew the two screws (Q) and loosen 2 screws (R), then carefully tear off the earth film and lift the keyboard unit to remove.

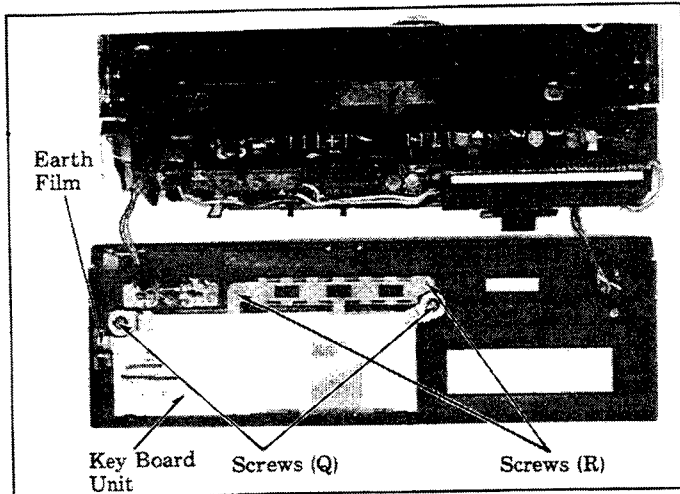


Fig. 13 Removal of the Key Board Unit-(2)

9. Removal of the System Control C. Board

- (1) Unlock the 5 locking tabs (S).
- (2) Disconnect the connectors P203, P601, P602 and flexible connectors FS61 and FS62.
- (3) Disconnect 2 hinges.

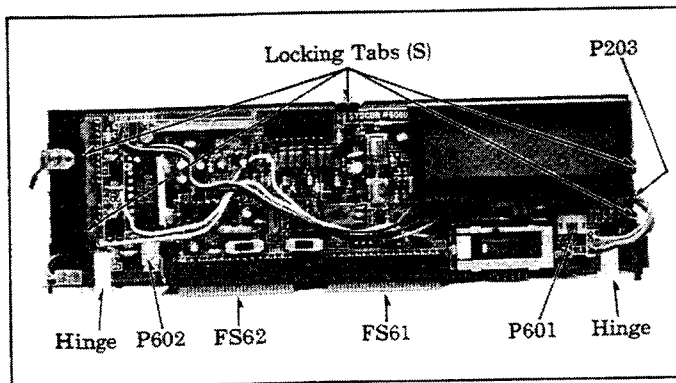


Fig. 14 Removal of the System Control C. Board

Notes:

- (1) Use extreme care so as not to damage the locking tabs.
- (2) Refer to Fig. 12 and disconnect 2 flexible connectors.

10. Removal of the Servo & Power Supply C. Board

- (1) Remove 3 screws (T) on the Servo & Power Supply C. Board. Then remove 5 screws on the Main C. Board. (Refer to Fig. 16)
- (2) Disconnect 2 direct connectors DS21 and DS22.

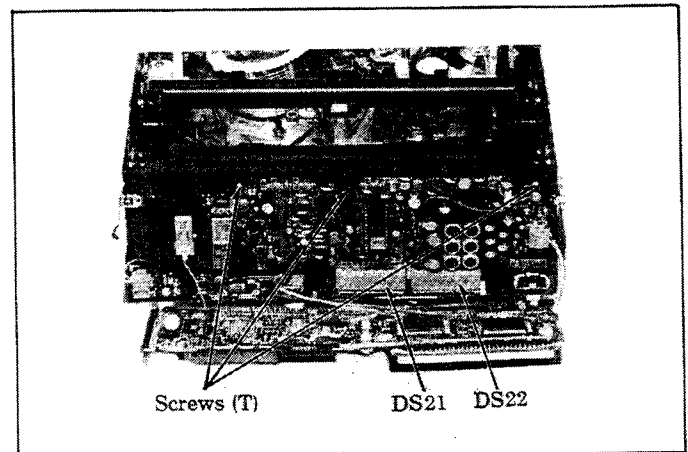


Fig. 15 Removal of the Servo & Power Supply C. Board

11. Removal of the Main C. Board

- (1) Place the deck upside down so the main C. Board faces upward.
- (2) Remove 5 screws (U) and disconnect a flexible connectors, Servo & Power Supply C. Board, System Control C. Board and Luminance/Chrominance & Audio C. Boards.

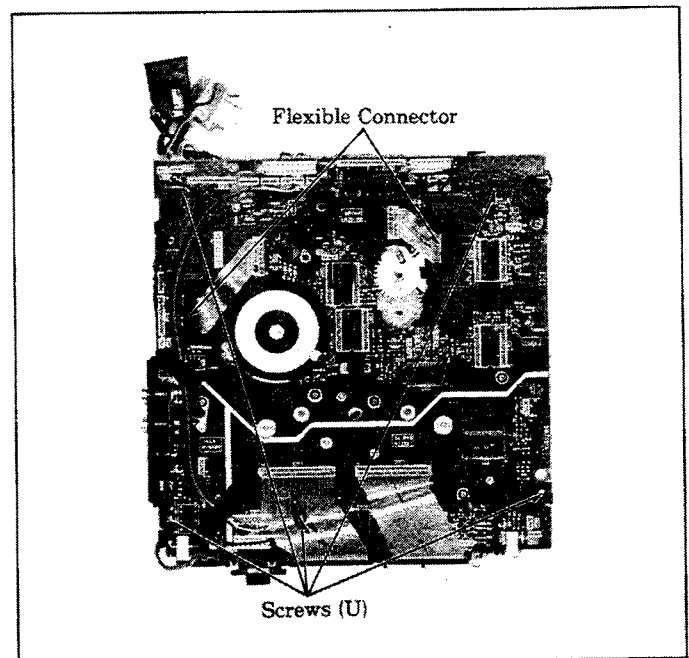


Fig. 16 Removal of Main C. Board-(1)

Note:

Refer to item 7, 9, 10 and remove the C. Boards.

- (4) Place the deck upside down so the chassis faces upward.
- (5) Disconnect 12 connectors P207 ~ P214, P216 ~ P218 and P221. Then lift a chassis.

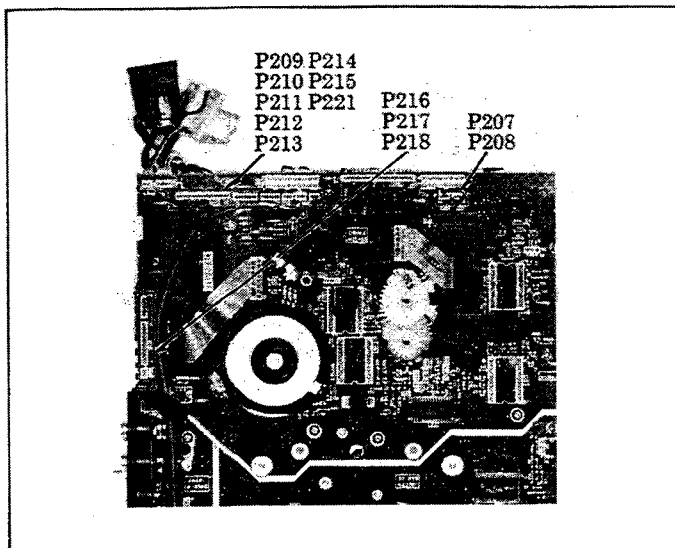


Fig. 17 Removal of Main C. Board-(2)

CAUTION

Do not loose the 3 small screws on the top of the cylinder as shown in Fig. 19.

If these 3 small screws are loosed, cylinder motor is broken and it can not remake.

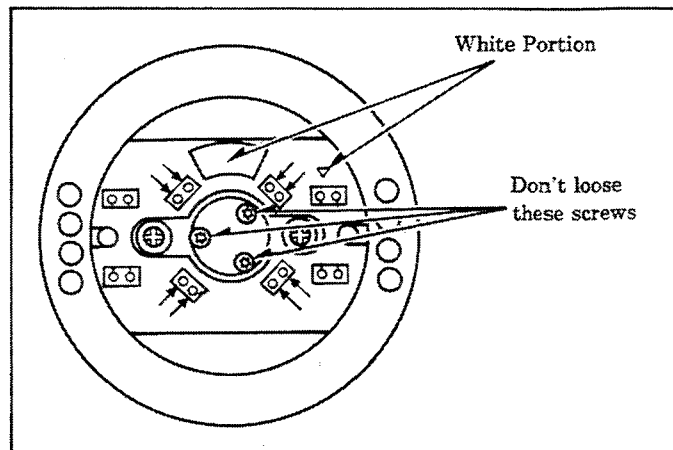


Fig. 19

2-1-3. REMOVING THE UPPER CYLINDER UNIT

First, remove two screws as shown in Fig. 18. Then unsolder 8 of the soldered portions indicated by arrows on the Upper Cylinder, and finally remove the Upper Cylinder.

Note:

Soldered portion can be easily removed by using solder sucking wire, etc.

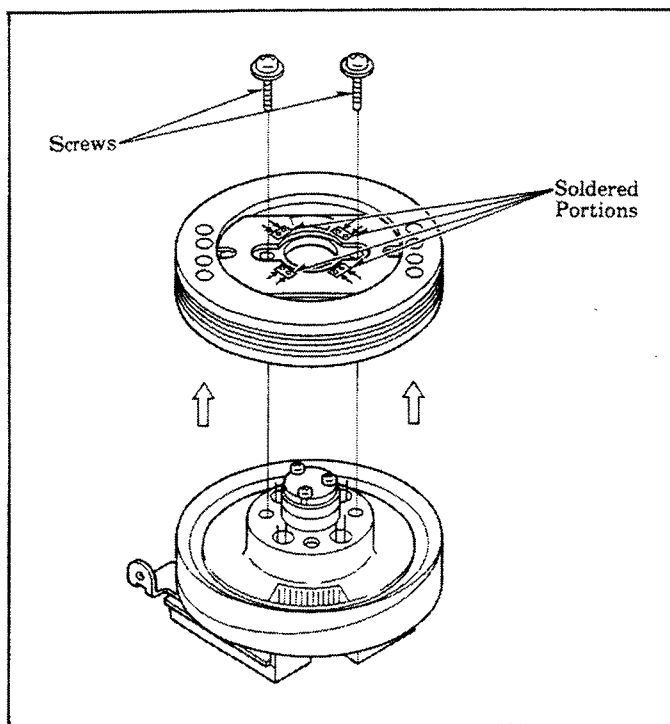


Fig. 18

2-1-4. REINSTALLING THE UPPER CYLINDER

The Upper Cylinder unit can be reinstalled by reversing the removal procedure.

However, when upper cylinder is installing, it is extremely-carefull so that white portion of P.C. board of upper cylinder correctly match the white portion of bottom cylinder as shown in Fig. 20.

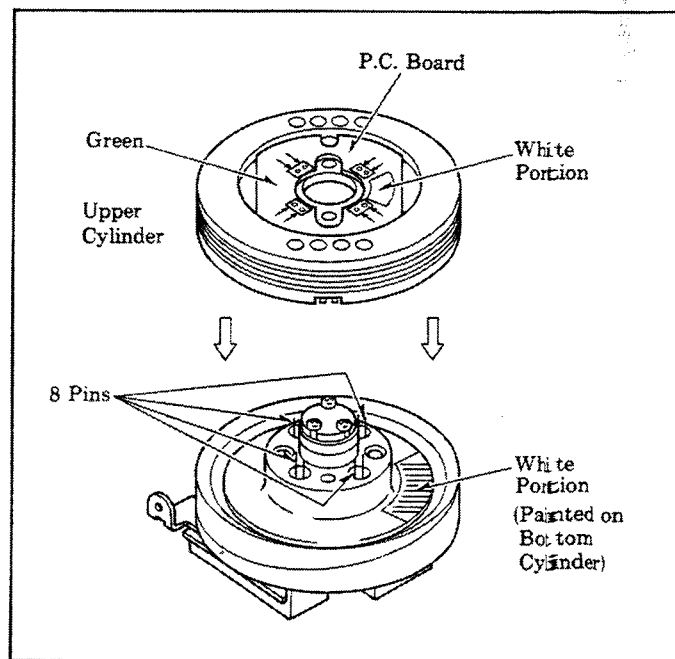


Fig. 20

Note:

If the Upper Cylinder Unit is reversely installed, no colour will appear when playing back a pre-recorded tape.

2-2. ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete electrical adjustment procedures which may be required for electronic circuits of VHS Portable Video Cassette Recorder NV-180.

2-2-1. TEST EQUIPMENTS

To perform the electrical adjustments completely, following equipments are required.

1. VTVM (Vacuum Tube Volt Meter) or DVM (Digital Volt Meter)
Voltage Range: 0.001 ~ 50V
2. Dual-Trace Oscilloscope
Voltage Range: 0.005 ~ 50V/div.
Frequency Range: DC ~ 10MHz
Probes: 10:1 or 1:1
3. Frequency Counter
Frequency Range: 0 ~ 10MHz
4. Signal Generator (Sinewave)
Frequency Range: 0 ~ 10MHz
5. Video Sweep Generator
Frequency Range: 0 ~ 10MHz
6. Colour Monitor TV
7. Plastic Tip Driver
8. VHS Alignment Tape (VFJ8125H3F)

2-2-2. HOW TO READ THE ADJUSTMENT PROCEDURES

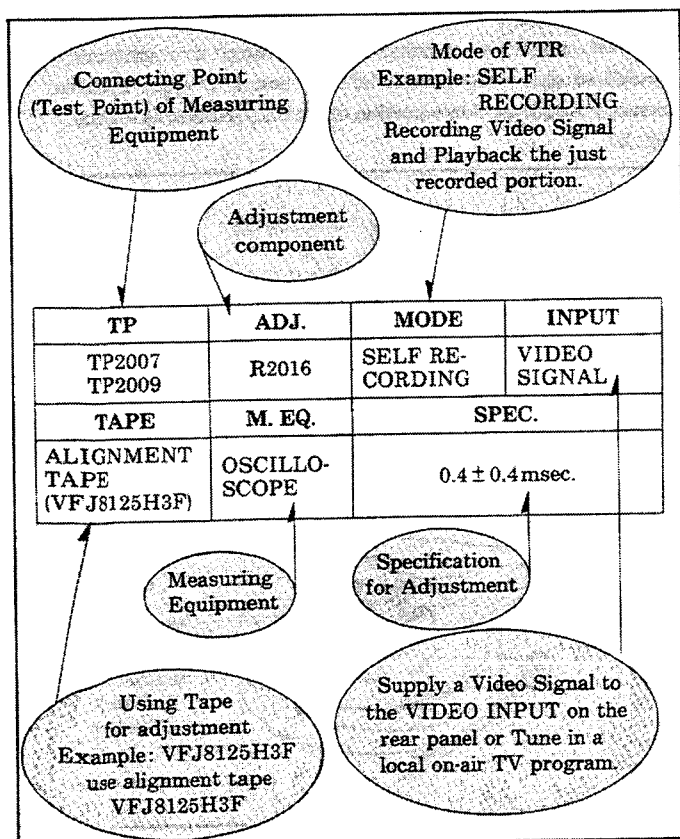


Fig. 21

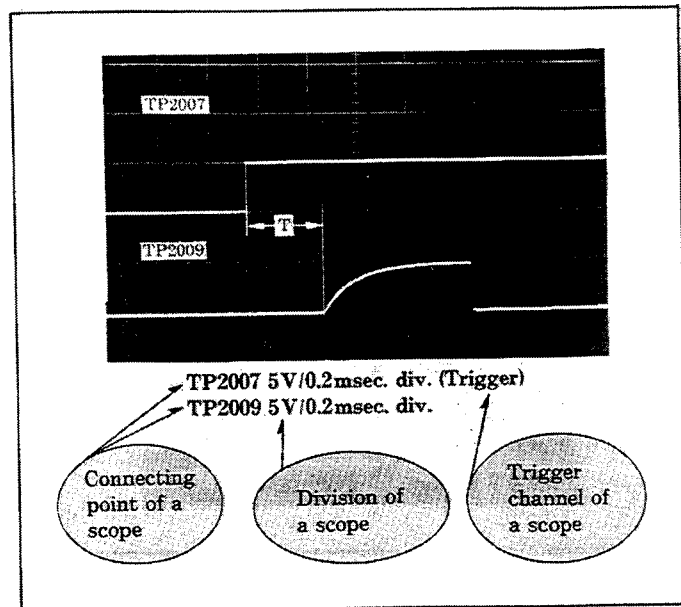


Fig. 22

POWER SUPPLY SECTION

2-2-3. REG +5V ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP1003	R1003	STOP	
TAPE	M. EQ.	SPEC.	
	D.V.M	5.1 ± 0.1V	

1. Input voltage from P214-2 is $12 \pm 0.3V$ DC.

SYSTEM CONTROL SECTION

2-2-4. UNDER CUT VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP6001	VR6001	REC • PLAY	
TAPE	M. EQ.	SPEC.	
	D.V.M		

1. Input voltage from P214-2 is $10.6 \pm 0.05V$ DC.
2. Turn VR6001 fully counterclockwise, and turn it clockwise till the indication of the D.V.M. becomes Low level from High level.

SERVO SECTION

2-2-5. PG SHIFTER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2001 TP3002	VR2001	PLAY	
TAPE	M. EQ.	SPEC.	
ALIGNMENT TAPE (VFJ8125H3F)	OSCILLO- SCOPE	$6.5 \pm 0.5H$	

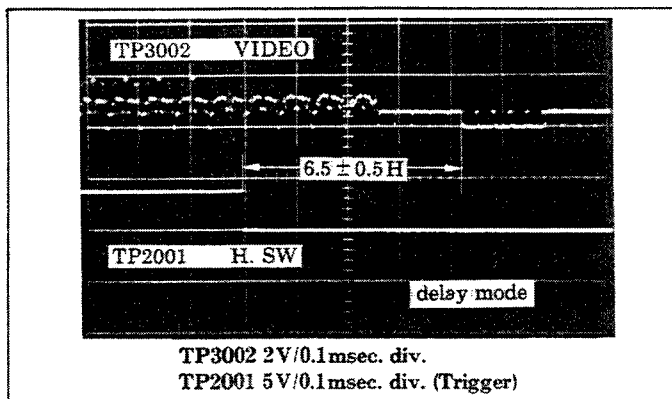


Fig. 23

2-2-6. TRACKING FIX ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2001 TP2002	VR2002	SELF RE- CORDING	VIDEO SIGNAL
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLO- SCOPE	$T = 13.4 \pm 0.4 \text{ msec.}$	

1. TRACKING VR is center fix position.
2. Play back the just recorded portion.
3. Adjust VR2002 for $13.4 \pm 0.4 \text{ msec.}$ as shown below.

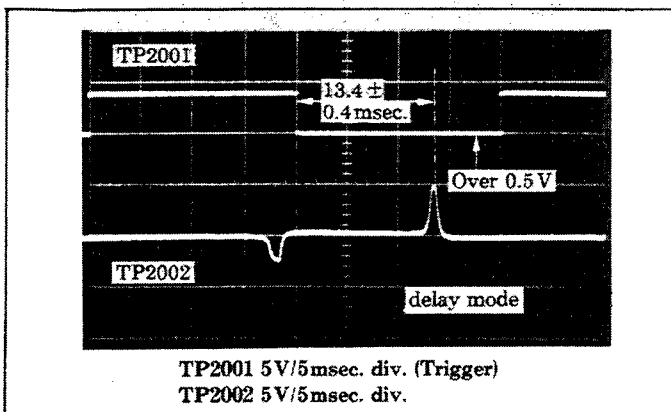


Fig. 24

2-2-7. FINE SLOW SPEED ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2015	VR2013	PLAY • STILL (SELF RE- CORDING)	
TAPE	M. EQ.	SPEC.	
BLANK TAPE	FREQUEN- CY COUNTER	$650 \pm 15 \text{ Hz}$	

1. SLOW TRACKING VR is center fix position.
2. Play back the just recorded portion.
3. Connect a jumper wire between TP2501 and the GND after making the deck in STILL mode.

2-2-8. ARTIFICIAL V-SYNC ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2001 TP3002	VR2210 VR2211	STILL (SELF RE- CORDING)	VIDEO SIGNAL
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLO- SCOPE	$A = 285 \pm 40 \mu\text{sec.}$ $W = 420 \pm 20 \mu\text{sec.}$	

1. Play back the just recorded portion and make the deck in STILL mode.

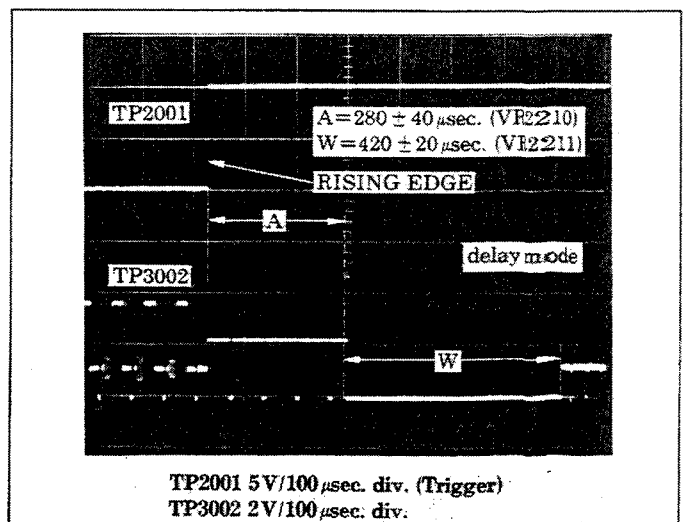


Fig. 25

LUMINANCE, CHROMINANCE SECTION

2-2-9. CONFIRMATION OF CHROMINANCE RECORDING CURRENT

TP	ADJ.	MODE	INPUT
TP3007		REC • PLAY	VIDEO SIGNAL
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	$30 \pm 4 \text{ mV}_{\text{p-p}}$	

1. Turn VR3001 so that the Y-REC CURRENT becomes minimum.
2. After this adjustment, readjust Y-REC CURRENT (VR3001).

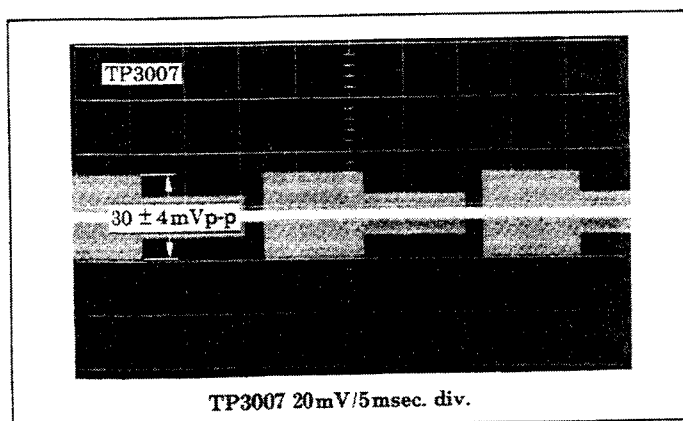


Fig. 26

2-2-10. LUMINANCE RECORDING CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3007	VR3001	REC • PLAY	VIDEO SIGNAL
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	$150 \pm 5 \text{ mV}_{\text{p-p}}$	

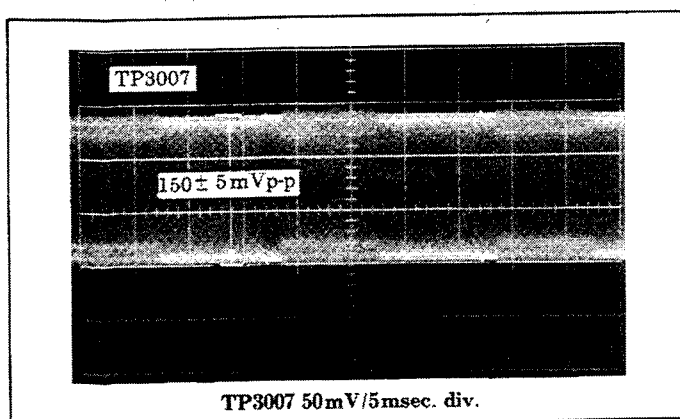


Fig. 27

2-2-11. PICTURE VR ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3501	VR3504	STOP	
TAPE	M. EQ.	SPEC.	
	V.T.V.M	$2.0 \pm 0.1 \text{ V}$	

2-2-12. HEAD AMP PEAK FREQUENCY ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3001	(FOR R', L' HEAD) C3035, C3036 VR3005, VR3006	PLAY	VIDEO SWEEP TP3010
TP3001	(FOR R, L HEAD) C3031, C3032 VR3007, VR3008	PLAY (TP317— TP3013 Short)	VIDEO SWEEP TP3011
TAPE	M. EQ.	SPEC.	
BLANK TAPE	VIDEO SWEEP OSCILLOSCOPE	PEAK is 4.9MHz portion (2MHz:4.9MHz=2:3)	

1. Set the marker of sweep generator output at 2MHz and 4.9MHz.

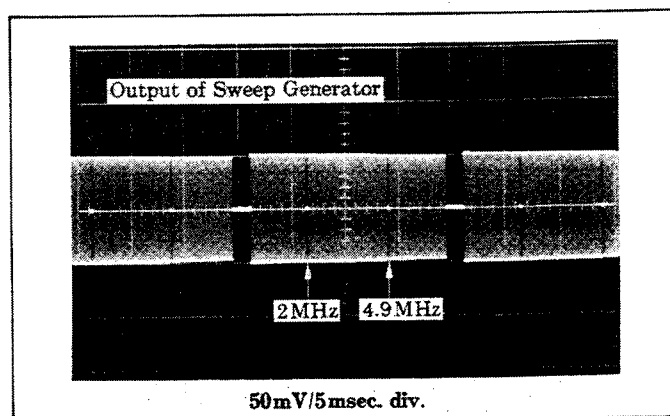


Fig. 28

2. Supply sweep generator output to TP3010.

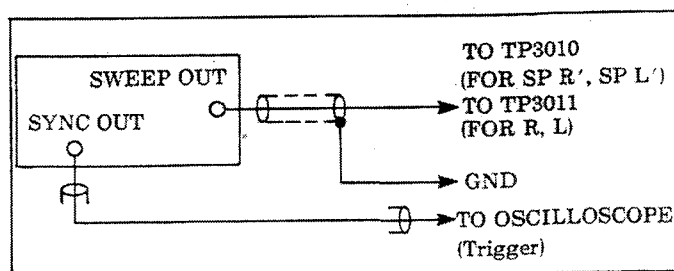


Fig. 29

3. Connect the oscilloscope to TP3001.
4. Adjust VR3005 (Q-SP R') and VR3006 (Q-SP L') for the envelopes of both channels as shown below 2MHz:4.9MHz (2:3) in PLAY mode.

Note 1:

Any level of sweep generator output will be OK, but if waveform is distorted, decrease the output of sweep generator.

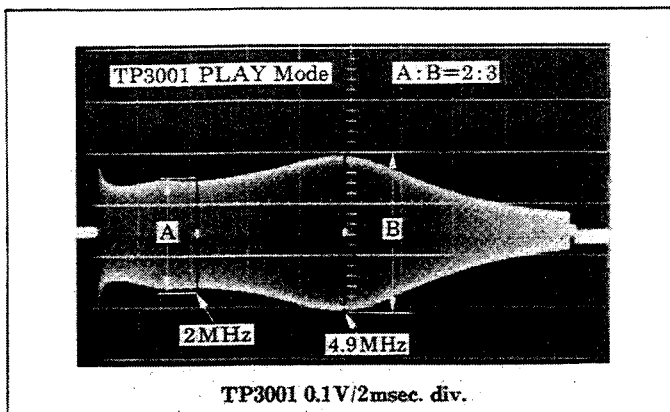


Fig. 30

5. Adjust C3035 (PEAK-SP R') and C3036 (PEAK-SP L') so that the peak points become 4.9MHz in PLAY mode as shown below.

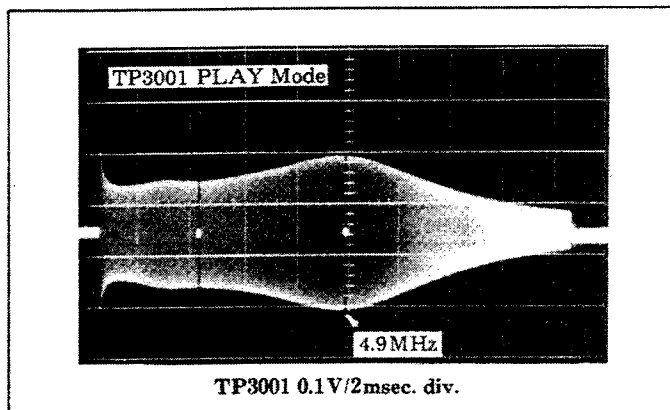


Fig. 31

6. Supply sweep generator to TP3011.
7. Connect a jumper wire between TP3017 and TP3013 and adjust VR3007 (Q-R) and VR3008 (Q-L) for the envelope in PLAY mode as shown below at TP3001. Regarding with output level of sweep generator, refer to note 1.

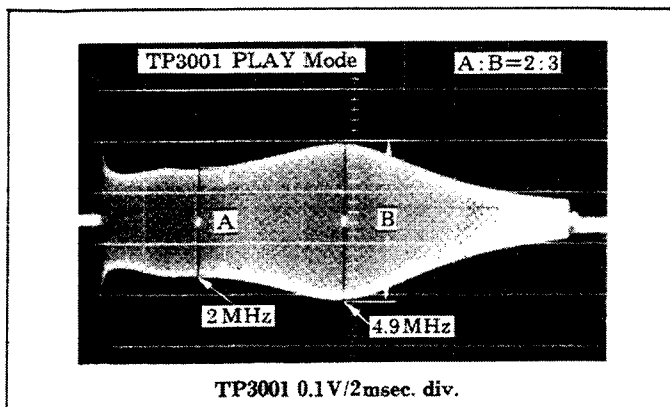


Fig. 32

8. Adjust C3031 (PEAK-L) and C3032 (PEAK-R) so that the peak point becomes 4.9MHz in PLAY mode as shown below.

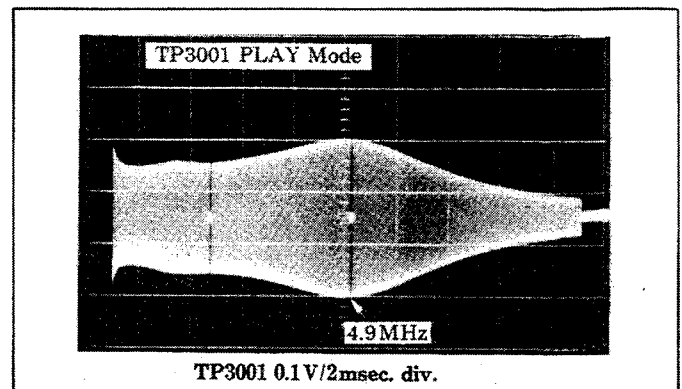


Fig. 33

2-2-13. HEAD AMP FREQUENCY RESPONSE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3002	(PLAY) VR3005 VR3006 (PLAY • STILL) VR3007 VR3008	PLAY, PLAY • STILL (SELF RE- CORDING)	VIDEO SWEEP
TAPE	M. EQ.	SPEC.	
BLANK TAPE	VIDEO SWEEP, OSCILLOSCOPE		

1. Set the sweep generator output as shown below.

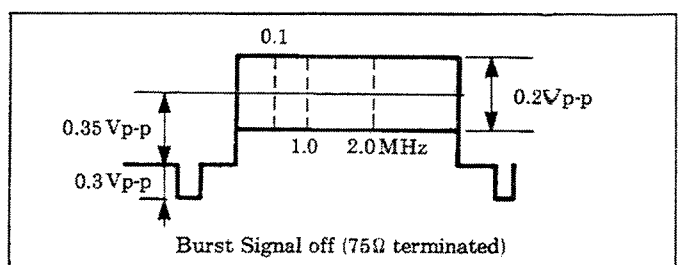


Fig. 34

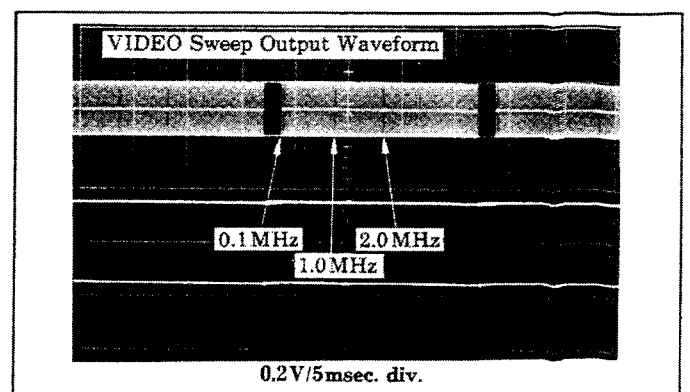


Fig. 35

2. PICTURE VR ADJUSTMENT is completed.
3. Play back the just recorded portion.
4. Adjust VR3005 and VR3006 so that the waveforms become as shown below in PLAY mode.

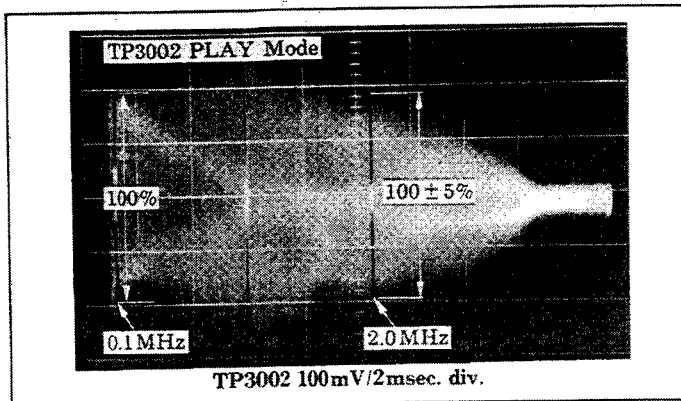


Fig. 36

5. Make the deck in PLAY • STILL mode.
6. Adjust VR3007 (Q-R) and VR3008 (Q-L) so that the waveform in PLAY • STILL mode becomes as shown below.

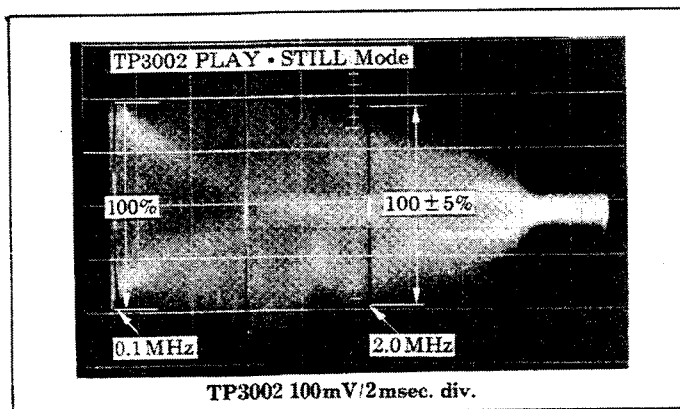


Fig. 37

2-2-14. SECAM KILLER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP8001	T8501	REC • PLAY	SECAM SIGNAL
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE		

1. Adjust T8501 so that the point "A" becomes minimum peak on the waveform as shown below.

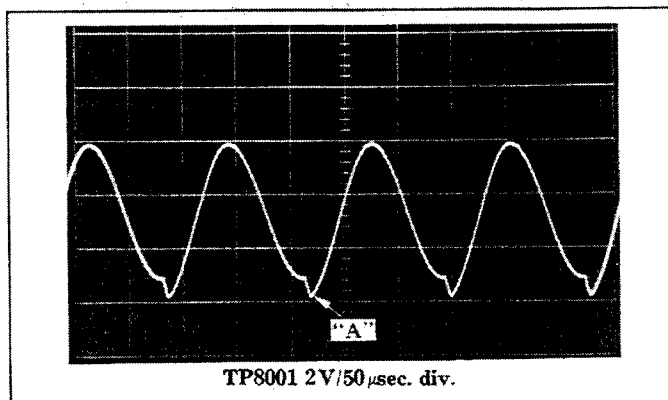


Fig. 38

AUDIO SECTION

2-2-15. AUDIO BIAS CURRENT ADJUSTMENT

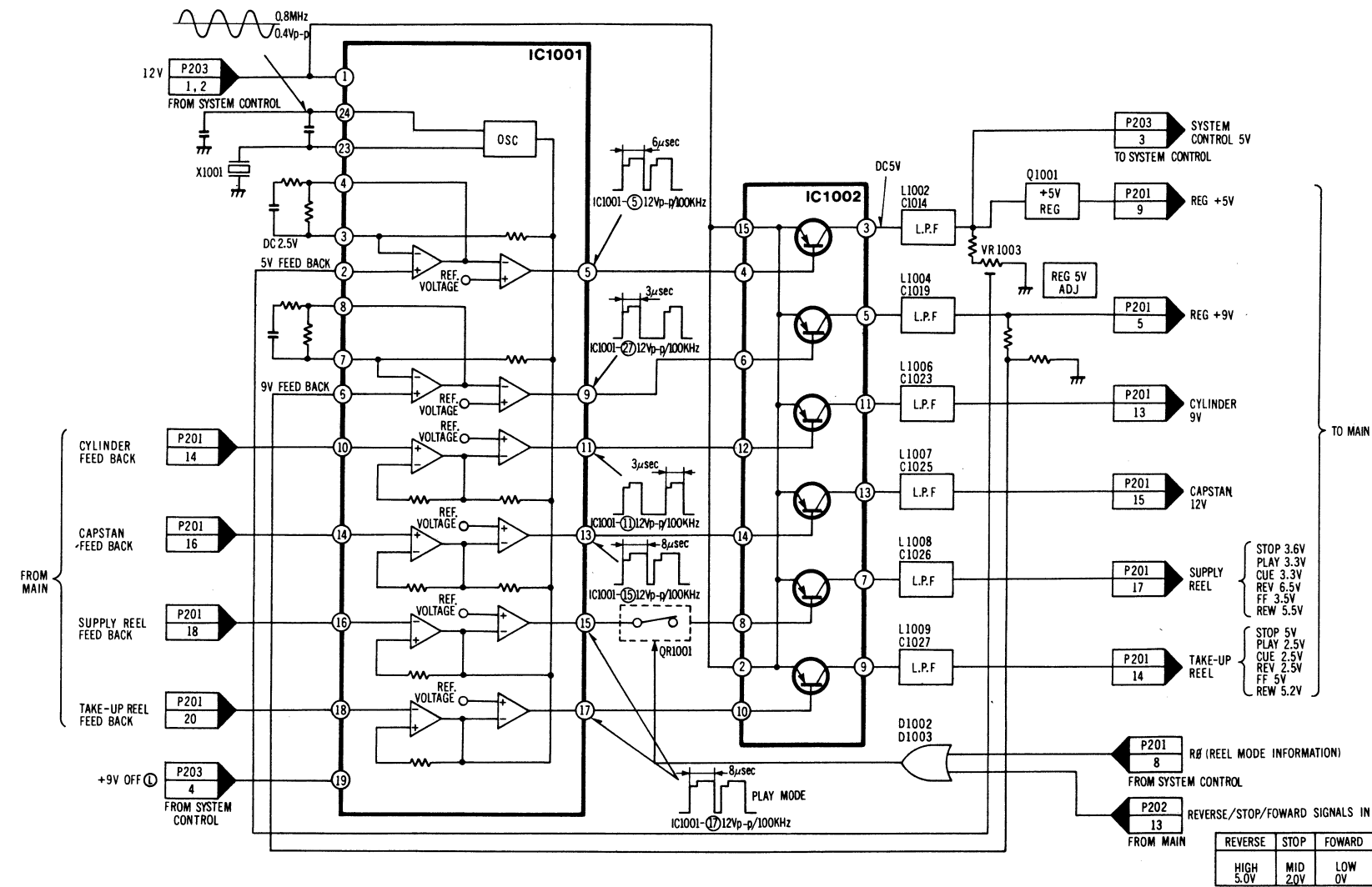
TP	ADJ.	MODE	INPUT
TP4002 TP4003	C4017	REC • PLAY	
TAPE	M. EQ.	SPEC.	
BLANK TAPE	V.T.V.M.	3.9 ± 0.1mVrms	

2-2-16. AUDIO PLAYBACK LEVEL ADJUSTMENT

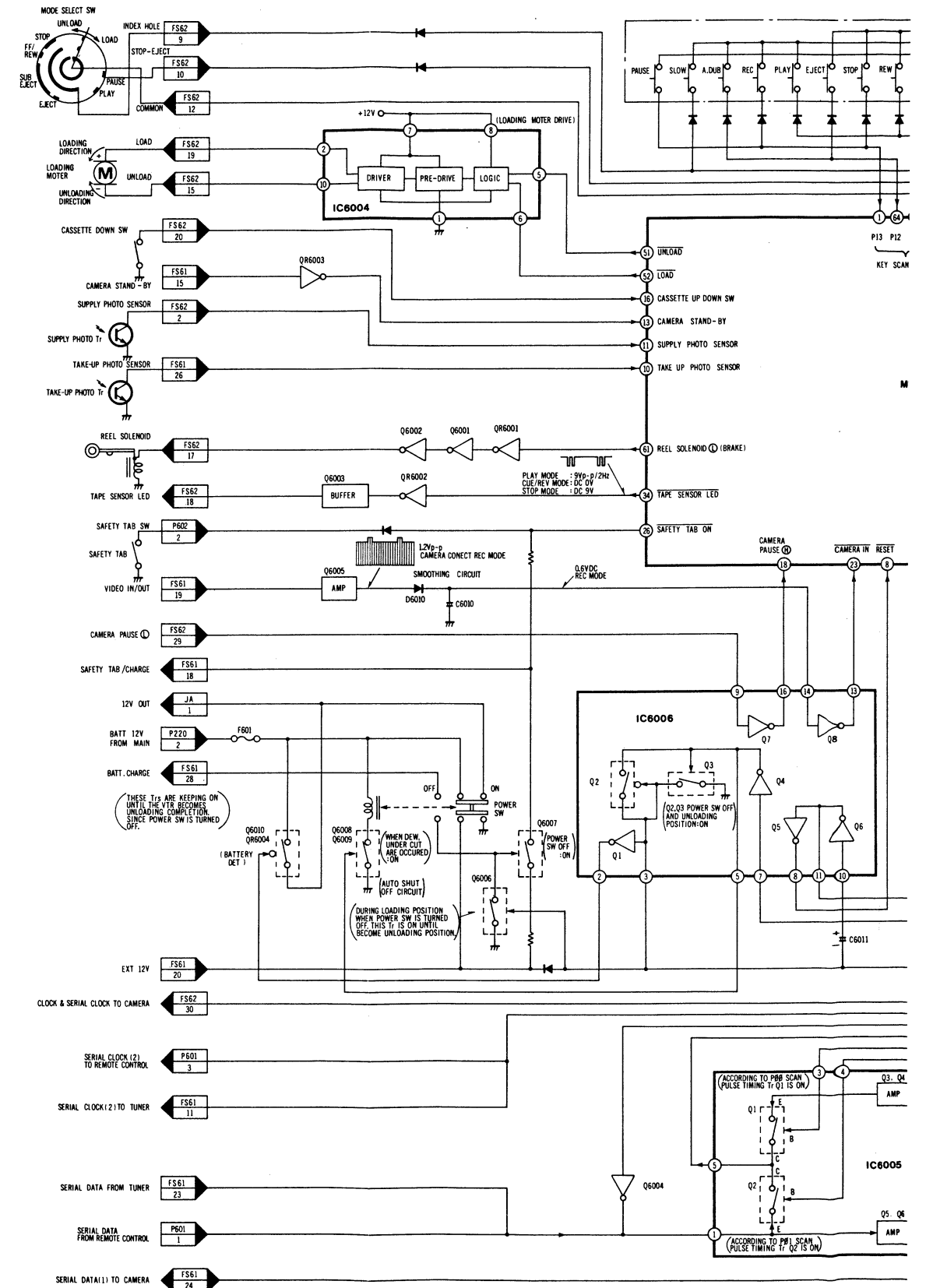
TP	ADJ.	MODE	INPUT
LINE OUT	VR4001	PLAY SELF RE- CORDING	1kHz. -60dBV (MIC IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	V.T.V.M.	E-E LEVEL ±0.5dB (E-E LEVEL= 410 ± 90mVrms)	

SECTION 3 BLOCK AND SCHEMATIC DIAGRAM

3-1. A.V.R. BLOCK DIAGRAM



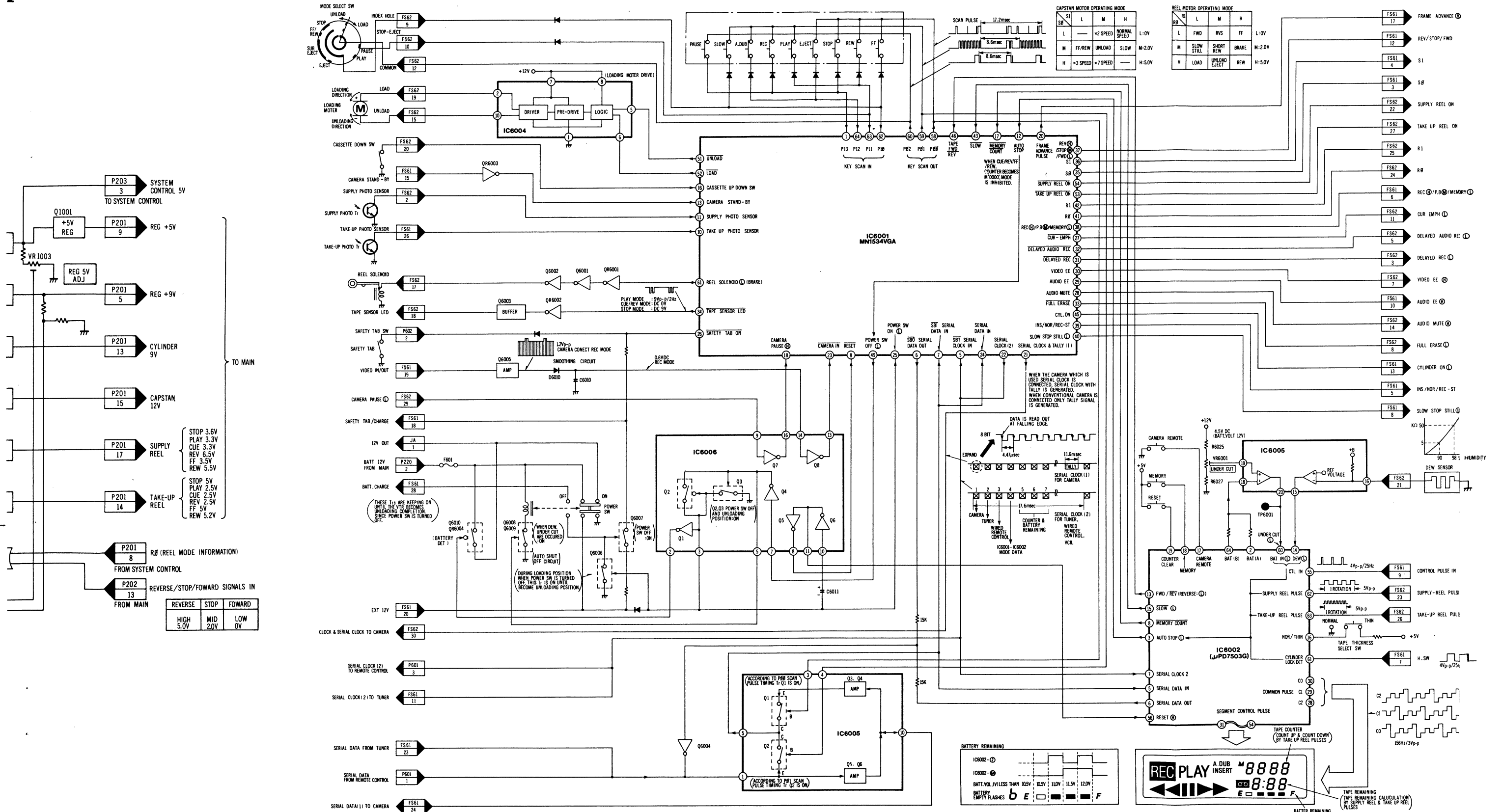
3-2. SYSTEM CONTROL BLOCK DIAGRAM

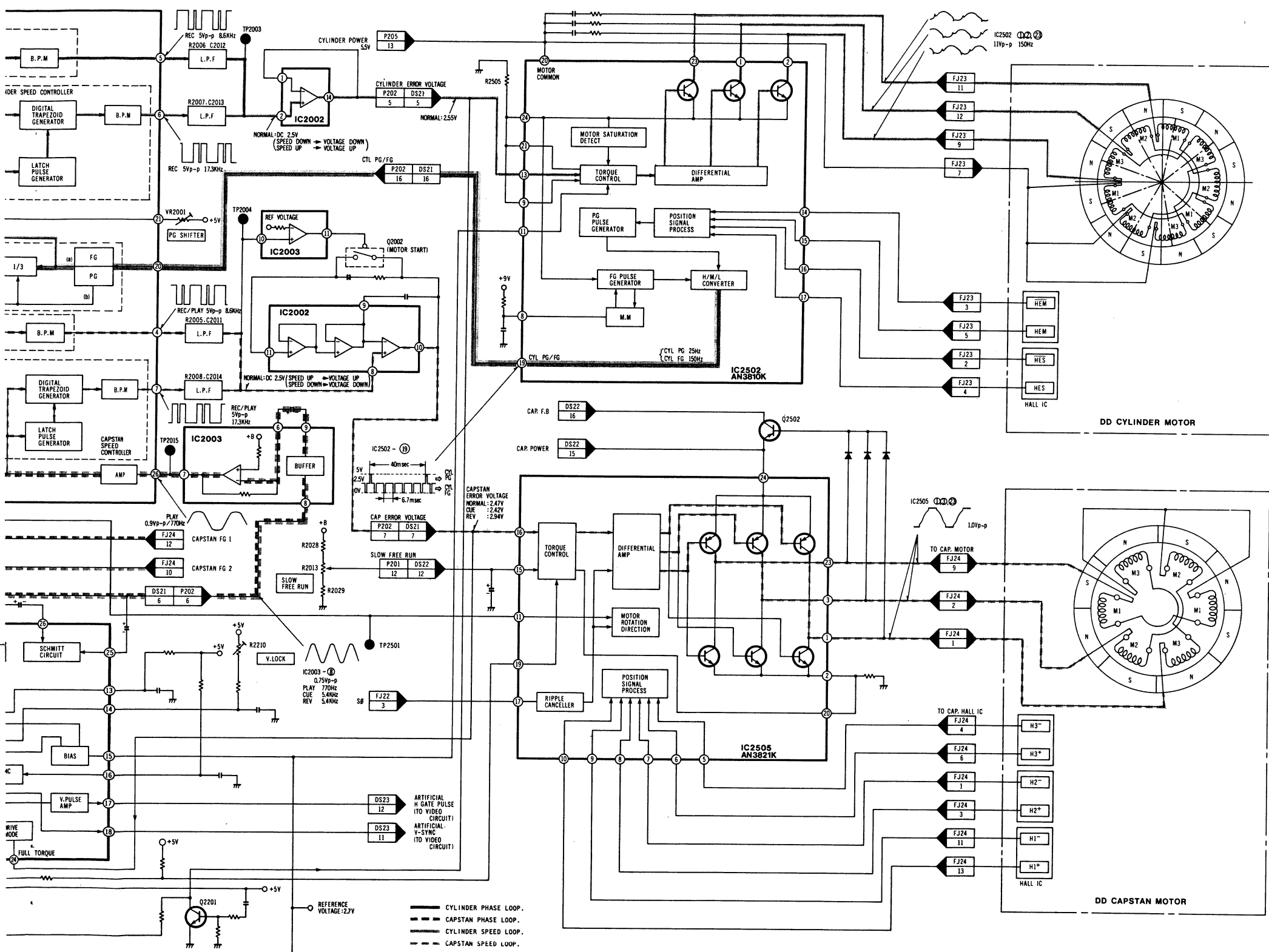


3-2. SYSTEM CONTROL BLOCK DIAGRAM

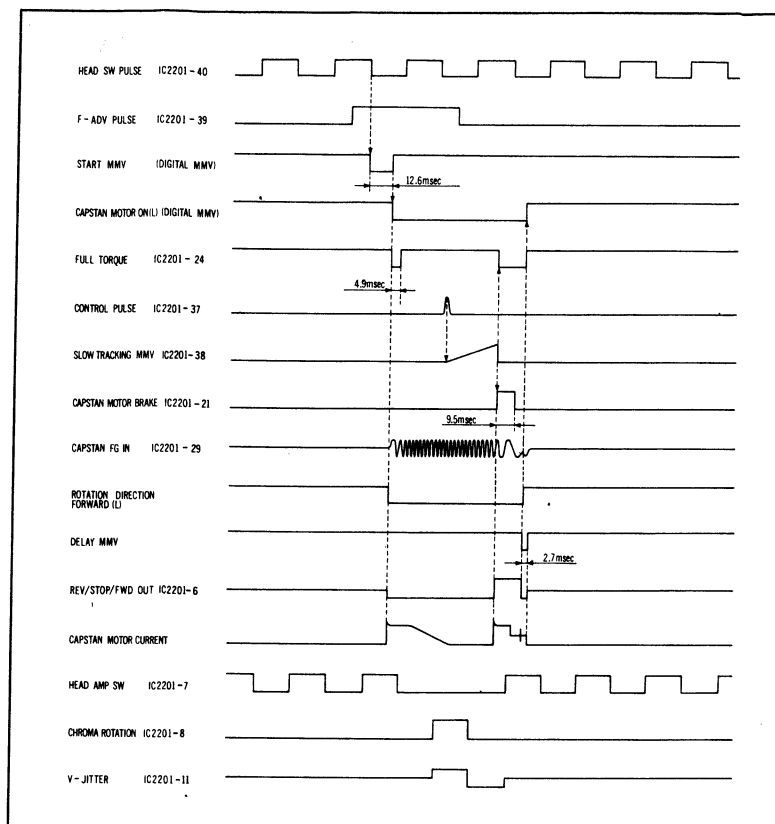
A.V.R. Section
SYSTEM CONTROL Section

I

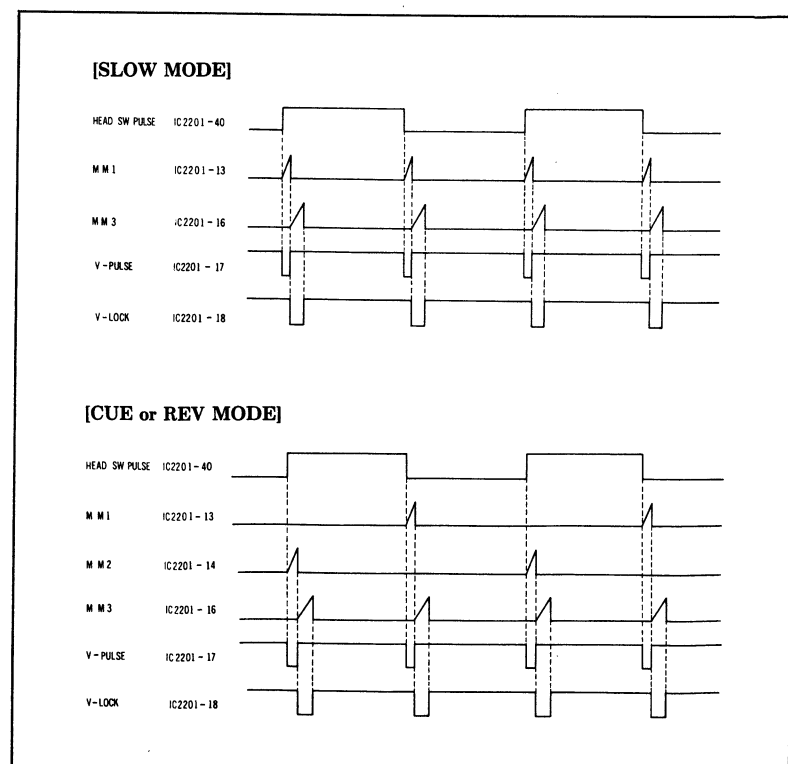




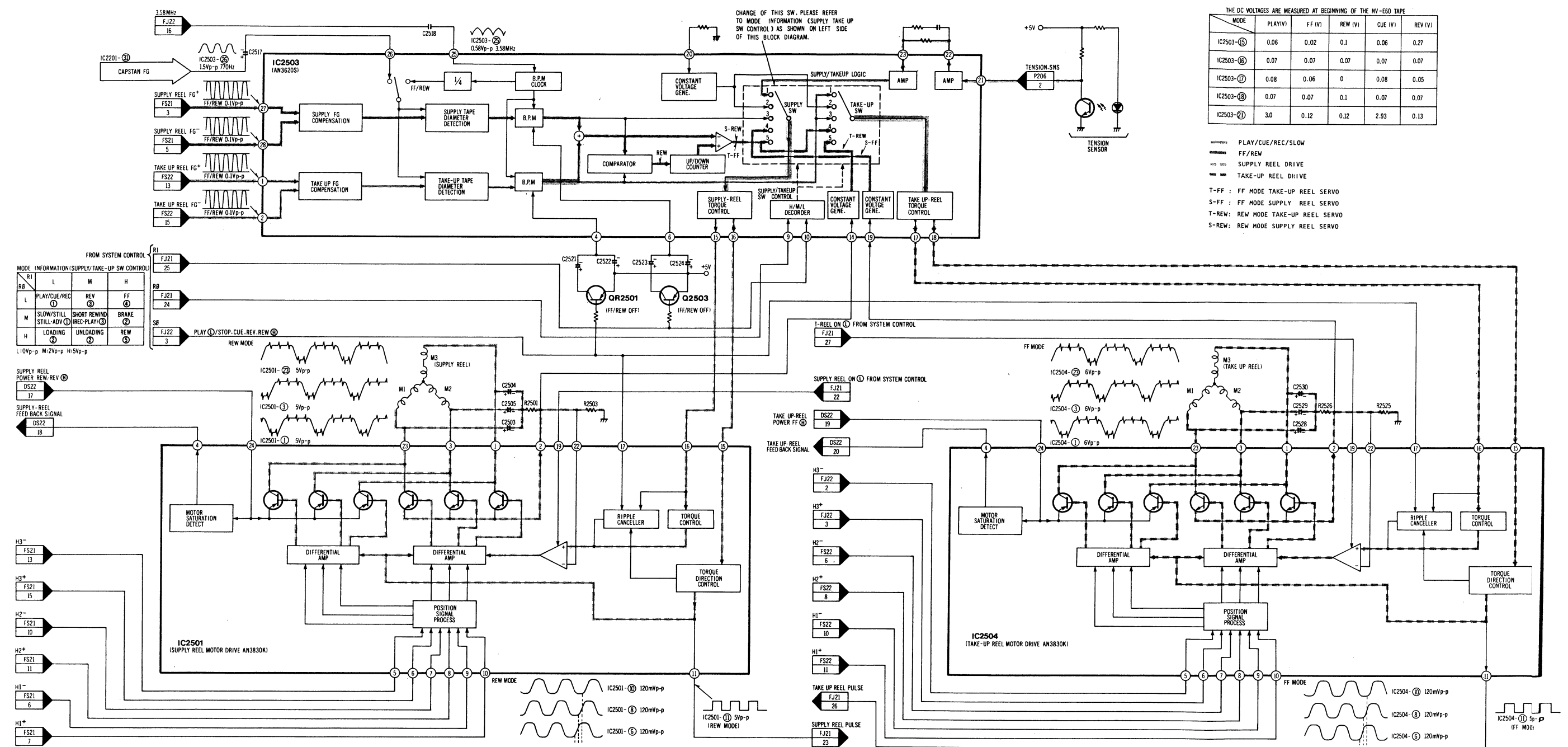
SLOW MODE TIMING CHART



ARTIFICIAL V-SYNC SIGNAL TIMING CHART



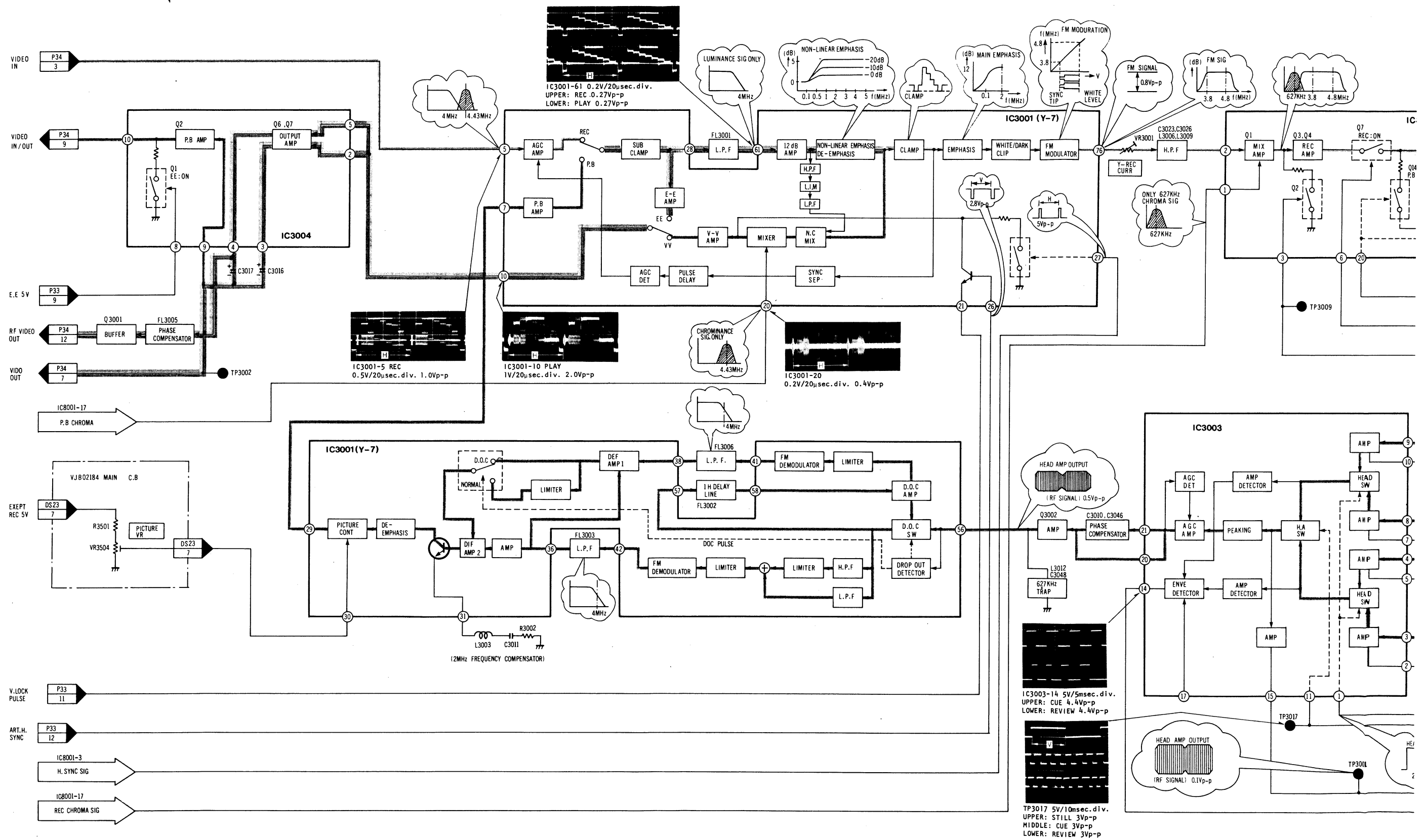
3-4. REEL SERVO BLOCK DIAGRAM

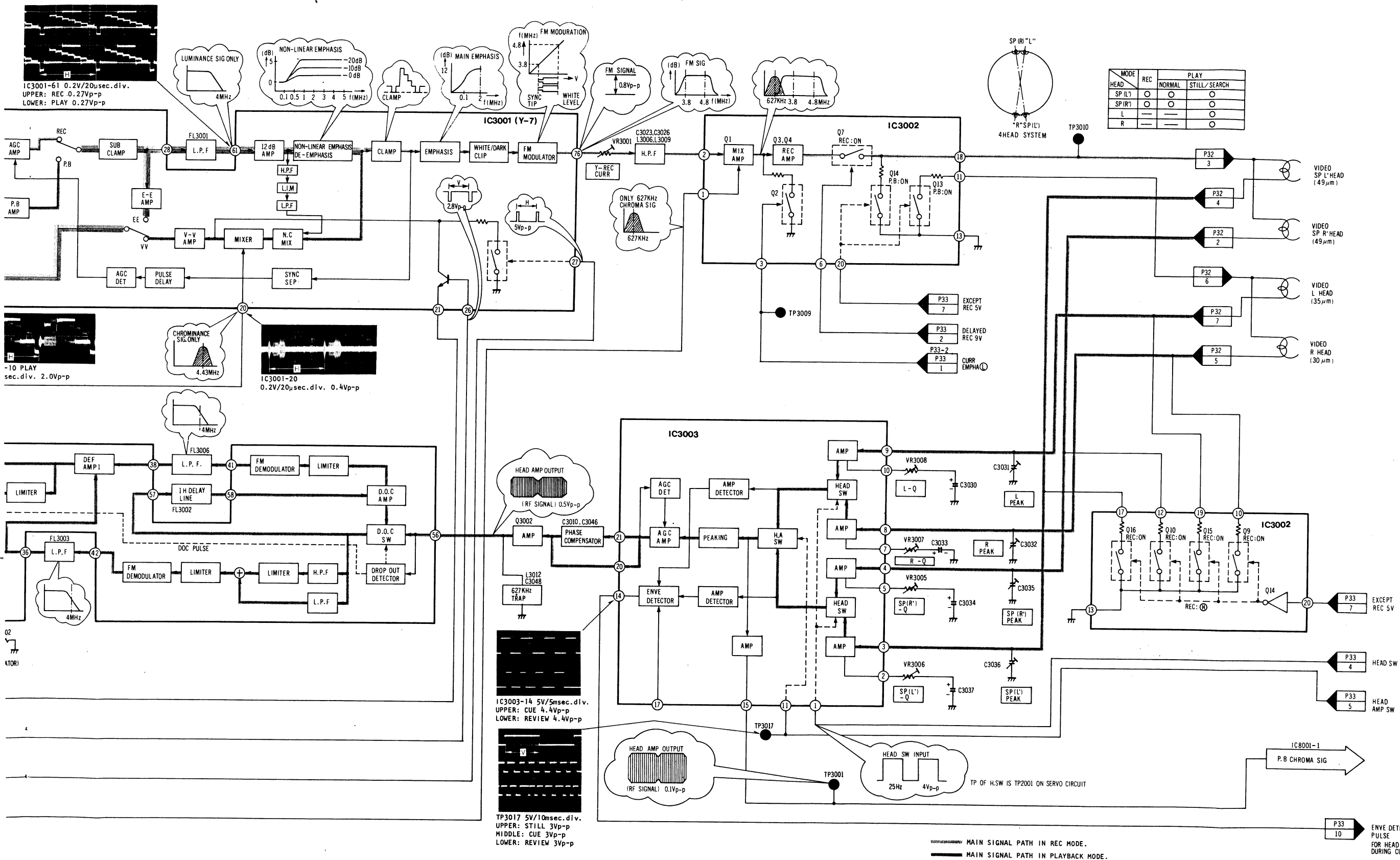


Back Page:
REEL SERVO Section



3-6. LUMINANCE PROCESS BLOCK DIAGRAM





FS62 (TO MAIN)

F201-1	E-E SW	(1)
F201-2	S-PHOT	(2)
F201-3	D-REC	(3)
F201-4	A-DUB	(4)
F201-5	D-A-REC	(5)
F201-6	REC	(6)
F201-7	VIDEO EE	(7)
F201-8	FULL ERASE	(8)
F201-9	INDEX HOLE	(9)
F201-10	STOP - EJECT	(10)
F201-11	CUR EMPH	(11)
F201-12	COMMON	(12)
F201-13		(13)
F201-14	AUDIO MUTE	(14)
F201-15	LOAD	(15)
F201-16	VY	(16)
F201-17	REEL SOL	(17)
F201-18	TAPE SENS. LED	(18)
F201-19	LOAD	(19)
F201-20	CASSETTE DOWN SW	(20)
F201-21	DEW SENSOR	(21)
F201-22	S-REEL ON	(22)
F201-23	S-REEL PULSE	(23)
F201-24	R I	(24)
F201-25	T-REEL PULSE	(25)
F201-26	T-REEL ON	(26)
F201-27		(27)
F201-28		(28)
F201-29	CAM PAUSE	(29)
F201-30	TALLY & CLK	(30)

TP6002 CDD PULSE
2V5/msec. div. 5.0V/p
TP6003 EJECT KEY CDD PULSE
2V5/msec. div. 5.0V/p

150Hz 3V-P-P

LCD

COMMON SIGNAL
- SEGMENT SIGNAL

RECPLAY

SAFETY TAB

POWER SW ON

CAMERA IN

CLK-2

FRAME ADV

MODE

TAKUP PHOTO

E-E 5V

IC8003 MN6283

IC8004 BA8209U3

IC8001 MN1534VGA

IC8002 JPD7503G

Q8001 2SD636

Q8002 2SB819

Q8003 2SD673

Q8004 2SD636

Q8005 2SD636

Q8006 2SD636

Q8007 2SD636

Q8008 2SD636

Q8009 2SD636

Q8010 2SD636

Q8011 2SD636

Q8012 2SD636

Q8013 2SD636

Q8014 2SD636

Q8015 2SD636

Q8016 2SD636

Q8017 2SD636

Q8018 2SD636

Q8019 2SD636

Q8020 2SD636

Q8021 2SD636

Q8022 2SD636

Q8023 2SD636

Q8024 2SD636

Q8025 2SD636

Q8026 2SD636

Q8027 2SD636

Q8028 2SD636

Q8029 2SD636

Q8030 2SD636

Q8031 2SD636

Q8032 2SD636

Q8033 2SD636

Q8034 2SD636

Q8035 2SD636

Q8036 2SD636

Q8037 2SD636

Q8038 2SD636

Q8039 2SD636

Q8040 2SD636

Q8041 2SD636

Q8042 2SD636

Q8043 2SD636

Q8044 2SD636

Q8045 2SD636

Q8046 2SD636

Q8047 2SD636

Q8048 2SD636

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Q8067 2SD636

Q8068 2SD636

Q8069 2SD636

Q8070 2SD636

Q8071 2SD636

Q8072 2SD636

Q8073 2SD636

Q8074 2SD636

Q8075 2SD636

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Q8080 2SD636

Q8081 2SD636

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Q8094 2SD636

Q8095 2SD636

Q8096 2SD636

Q8097 2SD636

Q8098 2SD636

Q8099 2SD636

Q8100 2SD636

Q8101 2SD636

Q8102 2SD636

Q8103 2SD636

Q8104 2SD636

Q8105 2SD636

Q8106 2SD636

Q8107 2SD636

Q8108 2SD636

Q8109 2SD636

Q8110 2SD636

Q8111 2SD636

Q8112 2SD636

Q8113 2SD636

Q8114 2SD636

Q8115 2SD636

Q8116 2SD636

Q8117 2SD636

Q8118 2SD636

Q8119 2SD636

Q8120 2SD636

Q8121 2SD636

Q8122 2SD636

Q8123 2SD636

Q8124 2SD636

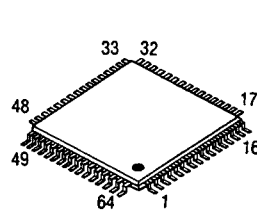
Q8125 2SD636



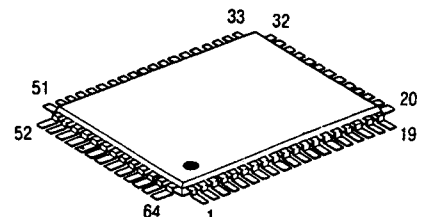
ICs & TRANSISTORS INFORMATION

SYSTEM CONTROL SCHEMATIC	
Transistor	
Q6001	C-5
Q6002	D-5
Q6003	F-4
Q6004	C-10
Q6005	C-17
Q6006	G-17
Q6007	G-17
Q6008	F-14
Q6009	F-14
Q6010	F-15
Q6011	E-3
Transistor & Resistor	
QR6001	C-4
QR6002	F-4
QR6003	G-11
QR6004	F-16
QR6005	G-7
QR6006	D-3
QR6007	G-14
Integrated Circuit	
IC6001	E-8
IC6002	E-12
IC6003	G-6
IC6004	E-3
IC6005	E-14
IC6006	C-14
Test Point	
TP6001	D-17
TP6002	G-4
TP6003	F-3
Adjustment	
VR6001	D-17
Connector	
FS61	H-19
FS62	F-1
FS63	G-3
JA	E-19
P601	F-19
P602	H-19

ADDRESS INFORMATION



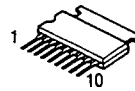
MN1534VGA



μPD7503G102



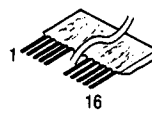
MN6283



BA6209U3



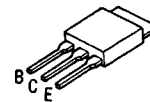
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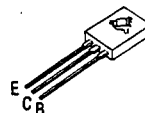
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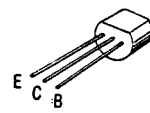
2SB641
2SB819
2SD636
2SD973



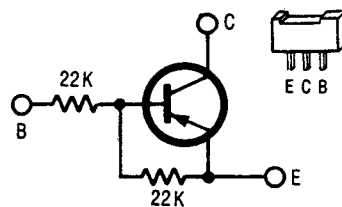
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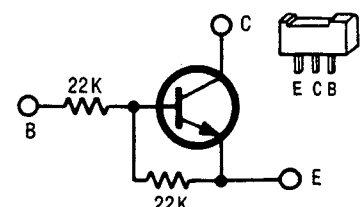
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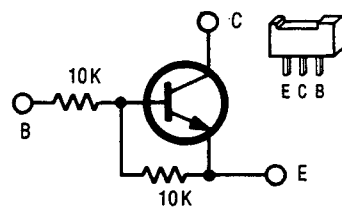
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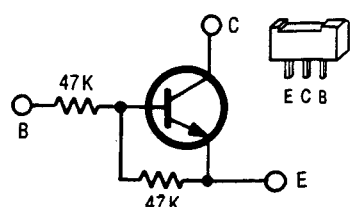
DTA124A



DTC124A



DTC114A



DTC144A

SYSTEM CONTROL ICs DC VOLTAGE CHART

		IC6001																			
REF. NO.	MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	STOP	5.0	4.0	5.0	5.0	4.7	0.2	4.6	0	0	0	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
	PLAY	5.1	3.9	5.0	5.0	4.6	0.6	4.2	0	3.1	4.8	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
	REC	5.1	3.9	5.1	5.1	4.6	0.3	4.2	5.1	0	5.1	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
	F.F	5.0	4.0	5.0	5.0	4.6	0.4	4.3	5.1	3.1	0	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
	REW	5.0	3.9	5.0	5.0	4.6	0.4	4.2	5.1	3.1	4.9	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
		IC6001																			
REF. NO.	MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	STOP	5.0	4.7	4.2	4.6	0.6	2.1	5.0	0	5.0	5.0	9.6	9.3	9.6	9.6	4.8	0	2.1	5.0	2.1	0
	PLAY	5.0	4.6	4.2	4.2	0.6	2.1	0	0	0	0	9.6	9.4	9.6	9.5	0	5.0	0	2.1	2.1	5.0
	REC	5.1	4.7	4.2	3.9	0.6	2.1	5.0	0	5.0	5.0	0.1	0.2	0.1	9.5	0.1	5.0	0.1	5.0	0.1	5.0
	F.F	5.0	4.6	4.2	4.2	0.6	2.1	5.0	0	5.0	5.0	9.1	9.2	9.2	0.1	4.9	0	2.1	5.0	2.1	0
	REW	5.0	4.6	4.2	4.3	0.6	5.1	5.0	0	5.0	5.0	9.1	9.2	9.1	0.1	4.9	0	2.1	5.0	2.1	0
		IC6001																			
REF. NO.	MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	STOP	2.1	5.0	5.1	4.6	5.0	0	0	0	5.2	0	0	0	5.0	5.0	2.9	5.0	0	0.9	1.5	0.7
	PLAY	0	0	5.1	5.0	0	5.1	0	0	5.2	0	0	0	0	0	2.9	5.0	0	0.9	1.5	0.7
	REC	0.1	0.1	5.1	0.1	0	5.1	0	0	5.2	0	0	0	0	0	2.9	5.1	0	0.9	1.5	0.7
	F.F	0	5.0	5.1	5.0	5.0	5.1	0	0	5.2	0	0	0	0	0	2.9	5.0	0	0.9	1.5	0.7
	REW	5.0	5.0	5.1	5.0	5.0	0	0	0	5.2	0	0	0	0	0	2.9	5.0	0	0.9	1.5	0.7
		IC6001																			
REF. NO.	MODE	61	62	63	64																
	STOP	5.0	1.1	1.2	5.0																
	PLAY	5.0	1.1	5.1	5.0																
	REC	5.1	1.1	5.1	5.1																
	F.F	5.0	1.1	1.1	5.0																
	REW	5.0	1.1	1.1	5.0																
		IC6002																			
REF. NO.	MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	STOP	0	0.2	5.0	0	3.7	3.8	4.6	5.0	5.0	0	0	5.0	5.1	4.9	5.1	5.2	0	0	0	2.5
	PLAY	0	0.2	5.1	0	4.3	2.0	4.6	5.0	5.1	0	0	5.1	5.1	4.9	5.1	5.2	0	0	0	2.5
	REC	0	0.2	5.1	0	3.8	2.0	4.7	5.0	5.1	0	0	5.1	5.1	4.9	5.1	5.2	0	0	0	2.5
	F.F	0	0.2	5.1	0	4.3	2.0	4.6	5.1	5.1	0	0	5.1	5.1	4.9	5.1	5.2	0	0	0	2.5
	REW	0	0.2	5.1	0	4.3	2.0	4.6	5.1	5.1	0	0	5.1	0	4.9	5.1	5.2	0	0	0	2.5
		IC6002																			
REF. NO.	MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	STOP	2.6	0	2.1	3.0	4.0	5.0	0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	PLAY	2.6	0	2.1	3.1	4.1	5.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	REC	2.6	0	2.2	3.1	4.0	5.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	F.F	2.6	0	2.1	3.1	4.0	5.1	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	REW	2.6	0	2.1	3.1	4.0	5.1	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
		IC6002																			
REF. NO.	MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	STOP	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	0.1	0	2.7	5.0	2.4	5.1
	PLAY	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.3	0	2.7	5.1	2.4	5.1
	REC	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0	0	2.7	5.1	2.4	5.1
	F.F	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.6	0	0	2.7	5.1	2.4	5.1
	REW	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0	0	2.7	5.1	2.4	5.1
		IC6002																			
REF. NO.	MODE	61	62	63	64																
	STOP	0	0.1	0.1	0																
	PLAY	2.0	2.5	2.5	0.1																
	REC	2.0	2.5	2.5	0.1																
	F.F	3.9	2.6	2.6	0.1																
	REW	3.9	2.6	2.6	0.1																
		IC6003										IC6004									
REF. NO.	MODE	1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8	9	10
	STOP	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.5	0.9	0.4	0	0	12.4	12.4	0.9	0.5
	PLAY	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.6	0.9	0.4	0	0	12.3	12.3	0.9	0.6
	REC	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.6	0.9	0.4	0	0	12.3	12.3	0.9	0.6
	F.F	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.6	0.9	0.4	0	0	12.3	12.3	0.9	0.5
	REW	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.5	0.9	0.4	0	0	12.3	12.3	0.9	0.5
		IC6005																			
REF. NO.	MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	STOP	4.6		0.9	1.5	4.2	0				4.6	5.0	5.0	4.7	5.2	4.9	0	12.4	3.8	3.9	5.1
	PLAY	2.8		0.9	1.5	4.2	0				2.4	5.0	5.0	4.7	5.2	4.9	0	12.3	3.8	4.1	5.1
	REC	4.6		0.9	1.5	4.2	0				2.4	5.0	5.0	4.7	5.2	4.9	0	12.3	3.8	4.0	5.1
	F.F	2.9		0.9	1.5	4.2	0				2.9	5.0	5.0	4.6	5.2	4.9	0	12.3	3.8	3.9	5.0
	REW	2.9		0.9	1.5	4.2	0				2.8	5.0	5.0	4.6	5.2	4.9	0	12.3	3.8	4.0	5.1
		IC6006																			
REF. NO.	MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
	STOP	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				
	PLAY	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				
	REC	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				
	F.F	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				
	REW	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				

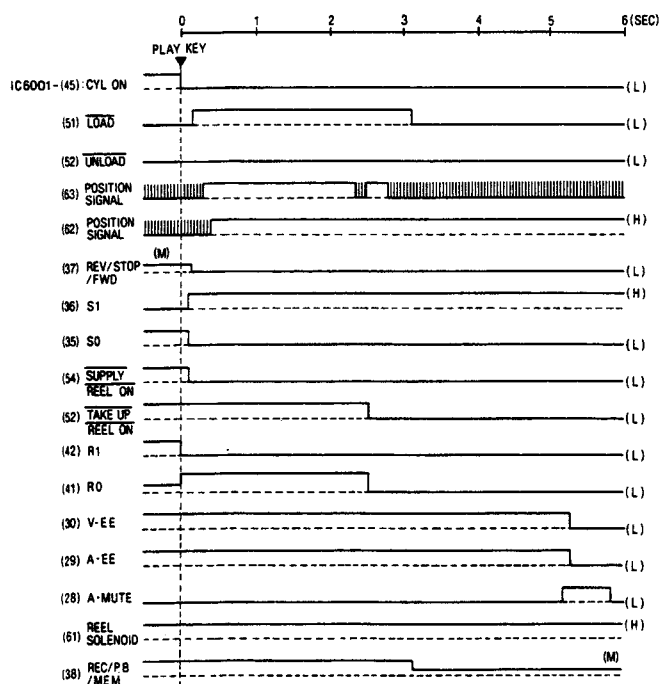
SYSTEM CONTROL TRANSISTORS DC VOLTAGE CHART

REF. NO.	Q6001			Q6002			Q6003			Q6004			Q6005			Q6006		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	11.9	0	12.4	0	11.9	0	12.4	0	0	1.0	0.6	5.0	0.1	4.5	0	0	0.3
PLAY	0	11.8	0	12.3	0	11.8	0.1	12.3	0.1	0	3	0.3	0	0	0	0	0	0.3
REC	0	11.8	0	12.3	0	11.8	0.1	12.3	0.1	0	3	0.3	5.1	0.1	4.5	0	0	0.3
F.F	0	11.8	0	12.3	0	11.8	9.0	12.3	9.6	0	3	0.3	5.0	0.1	4.5	0	0	0.3
REW	0	11.8	0	12.3	0	11.8	9.0	12.3	9.6	0	3	0.3	5.0	0.2	4.5	0	0	0.3
REF. NO.	Q6007			Q6008			Q6009			Q6010			Q6011					
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	10.2	0	0	12.4	0	0	12.4	0	12.4	12.4	12.1	9.6	1.3	11.2			
PLAY	0	3.7	0	0	12.3	0	0	12.3	0	12.3	12.3	12.0	9.6	1.3	11.2			
REC	0	3.7	0	0	12.3	0	0	12.3	0	12.3	12.3	12.0	9.6	1.3	11.2			
F.F	0	10.2	0	0	12.3	0	0	12.3	0	12.3	12.3	12.0	9.6	1.3	11.2			
REW	0	10.2	0	0	12.3	0	0	12.3	0	12.3	12.3	12.0	9.6	1.3	11.2			
REF. NO.	QR6001			QR6002			QR6003			QR6004			QR6005			QR6006		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	5.2	0	4.9	9.6	0	9.6	0	5.2	0	12.4	12.1	12.3	0	0.1	5.2	0	5.2	0
PLAY	5.2	0	5.0	9.6	0	9.5	0	5.2	0	12.3	12.0	12.3	0	0.1	5.2	0	5.2	0
REC	5.2	0	5.0	9.6	0.1	9.5	0	5.2	0	12.3	12.0	12.3	0	0.1	5.2	0	5.2	0
F.F	5.2	0	5.0	9.6	9.6	0.1	0	5.2	0	12.3	12.0	12.2	0	0.1	5.2	0	5.2	0
REW	5.2	0	5.0	9.6	9.6	0.1	0	5.2	0	12.3	12.0	12.2	0	0.1	5.2	0	5.2	0

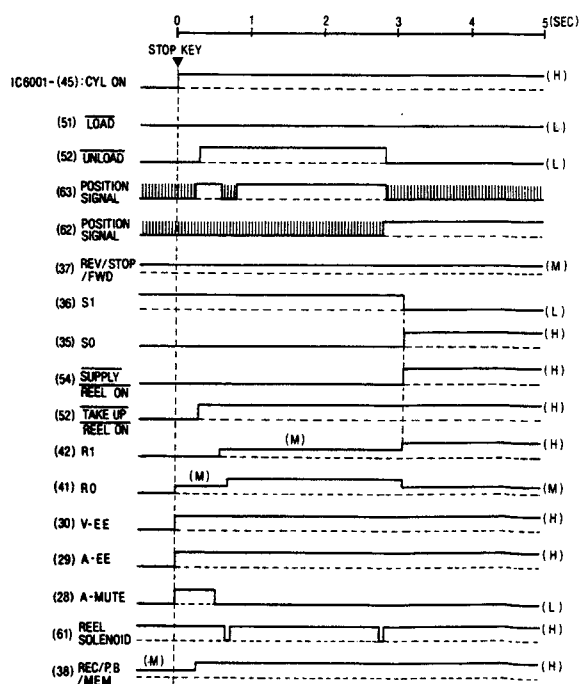
MICROPROCESSOR IC6001 (MN1534VGA)

MODE BY MODE TIMING CHART

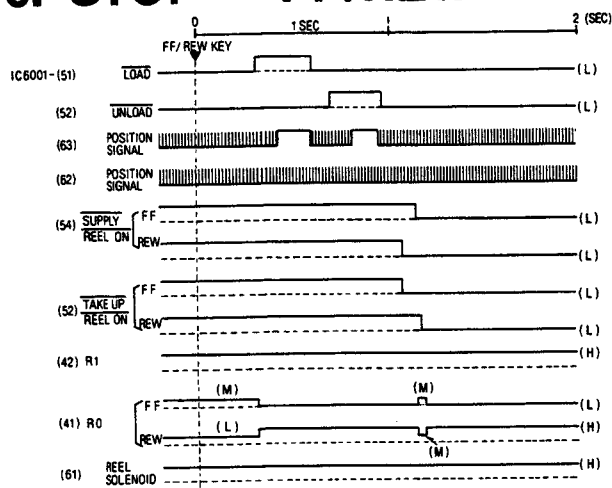
1. STOP → PLAY



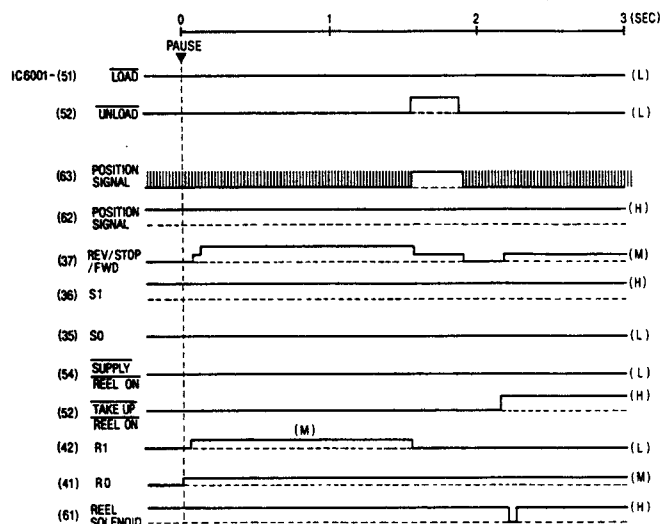
2. PLAY → STOP



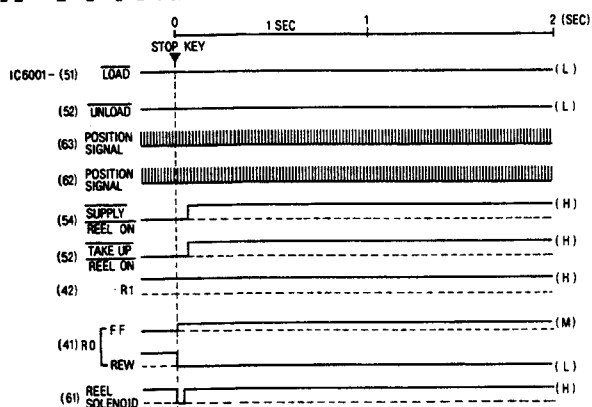
3. STOP → FF/REW



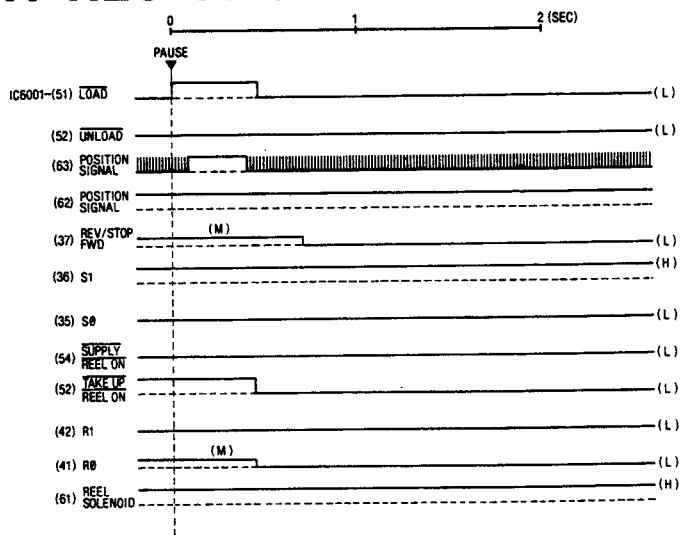
6. REC·PLAY → REC·PAUSE



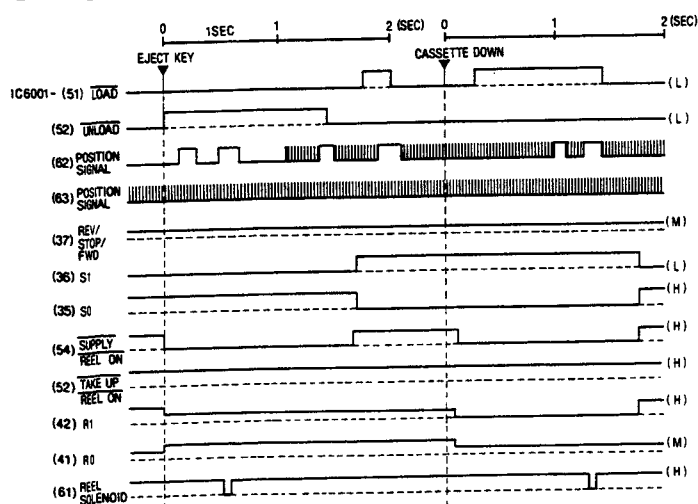
4. FF/REW → STOP



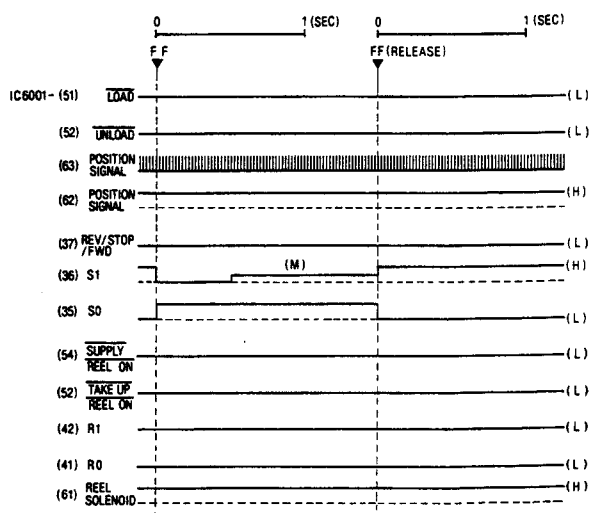
7. REC·PAUSE → REC·PLAY



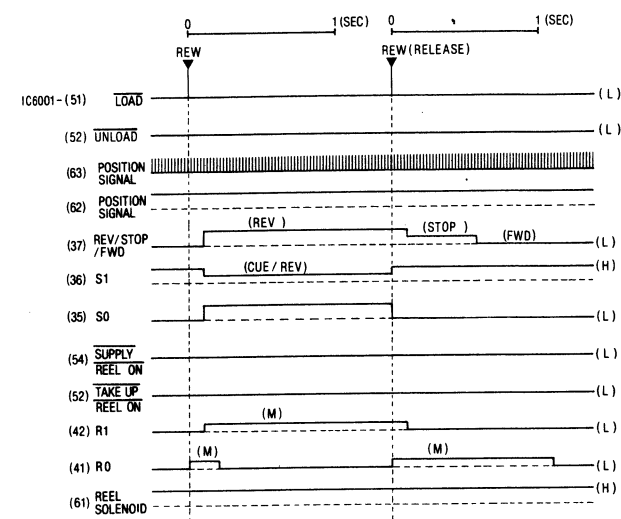
5. STOP → EJECT



8. PLAY → CUE → PLAY



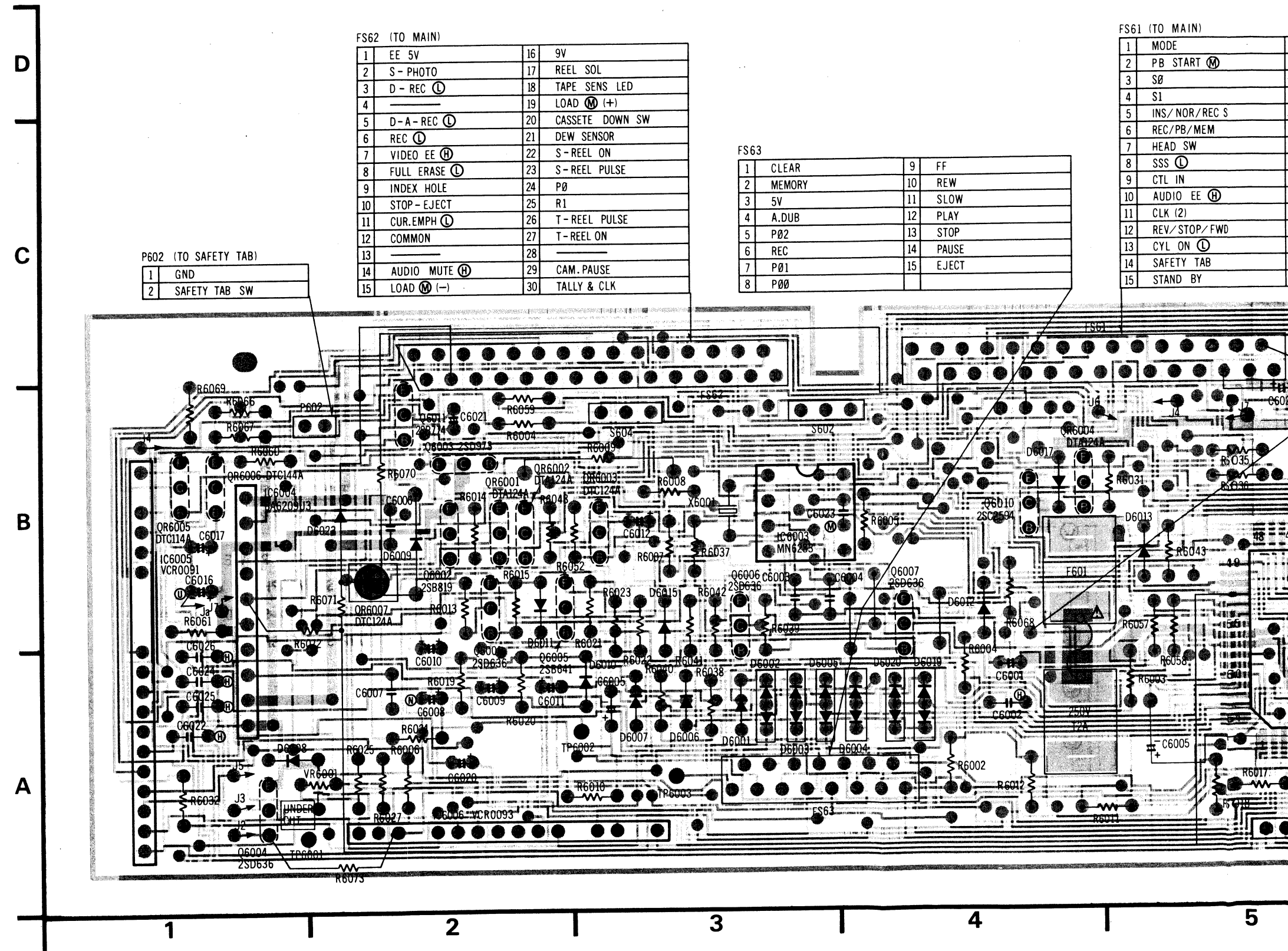
9. PLAY → REVIEW → PLAY



SYSTEM CONTROL CIRCUIT BOARD	
Transistor	
Q6001	B-2
Q6002	B-2
Q6003	B-2
Q6004	A-1
Q6005	B-2
Q6006	B-3
Q6007	B-4
Q6008	B-7
Q6009	B-7
Q6010	B-4
Q6011	B-2
Transistor & Resistor	
QR6001	B-4
QR6002	B-2
QR6003	B-3
QR6004	B-4
QR6005	B-1
QR6006	B-1
QR6007	B-2
Integrated Circuit	
IC6001	B-5
IC6002	A-7
IC6003	B-3
IC6004	B-1
IC6005	B-1
IC6006	A-2
Test Point	
TP6001	A-2
TP6002	A-3
TP6003	A-3
Adjustment	
VR6001	A-2

ADDRESS INFORMATION

3-8. SYSTEM CONTROL CIRCUIT BOARD (VEP06218A)



1	EE 5V	16	9V
2	S - PHOTO	17	REEL SOL
3	D - REC (L)	18	TAPE SENS LED
4	—	19	LOAD (M) (+)
5	D - A - REC (L)	20	CASSETTE DOWN SW
6	REC (L)	21	DEW SENSOR
7	VIDEO EE (H)	22	S - REEL ON
8	FULL ERASE (L)	23	S - REEL PULSE
9	INDEX HOLE	24	PØ
10	STOP - EJECT	25	R1
11	CUR. EMPH (L)	26	T - REEL PULSE
12	COMMON	27	T - REEL ON
13	—	28	—
14	AUDIO MUTE (H)	29	CAM. PAUSE
15	LOAD (M) (-)	30	TALLY & CLK

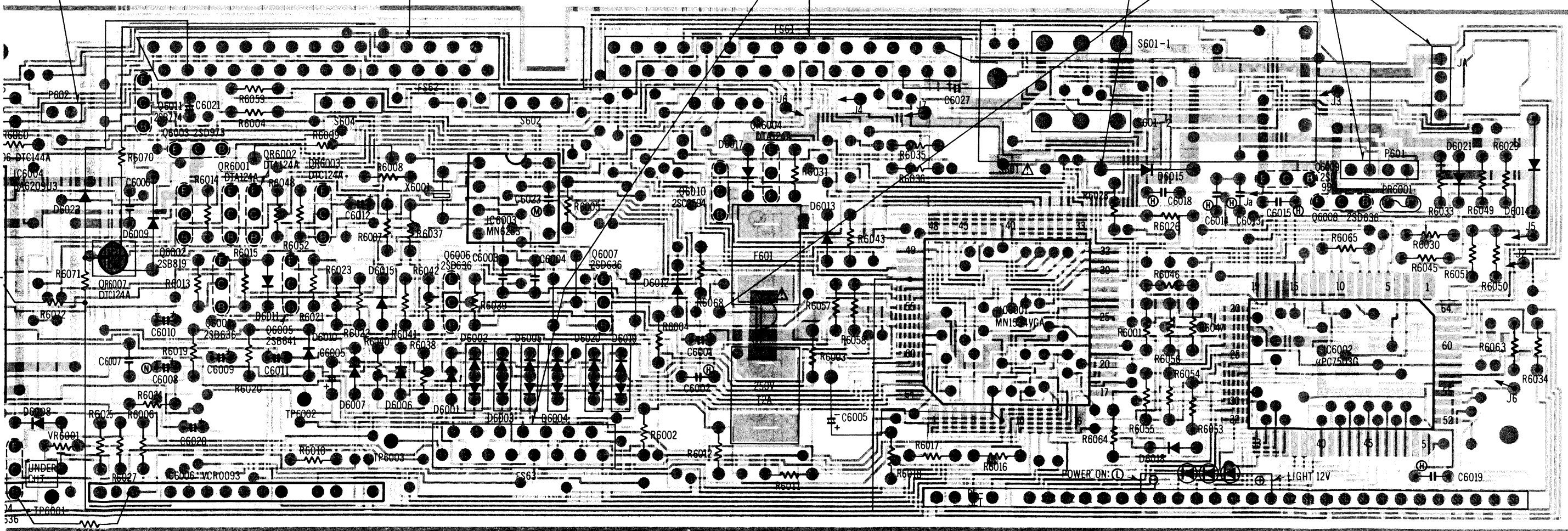
1	CLEAR	9	FF
2	MEMORY	10	REW
3	5V	11	SLOW
4	A.DUB	12	PLAY
5	P02	13	STOP
6	REC	14	PAUSE
7	P01	15	EJECT
8	P00		

1	MODE	16	3.58MHz
2	PB START (M)	17	FA (H)
3	SØ	18	SAFETY TAB/CHARGE
4	S1	19	VIDEO IN/OUT
5	INS/NOR/REC S	20	EXT 12V
6	REC/PB/MEM	21	GND
7	HEAD SW	22	_____
8	SSS (L)	23	DATA (2)
9	CTL IN	24	DATA (1)
10	AUDIO EE (H)	25	_____
11	CLK (2)	26	T - PHOTO
12	REV/STOP/FWD	27	LIGHT 12V
13	CYL ON (L)	28	BATT CHARGE
14	SAFETY TAB	29	GND
15	STAND BY	30	CAMERA IN (L)

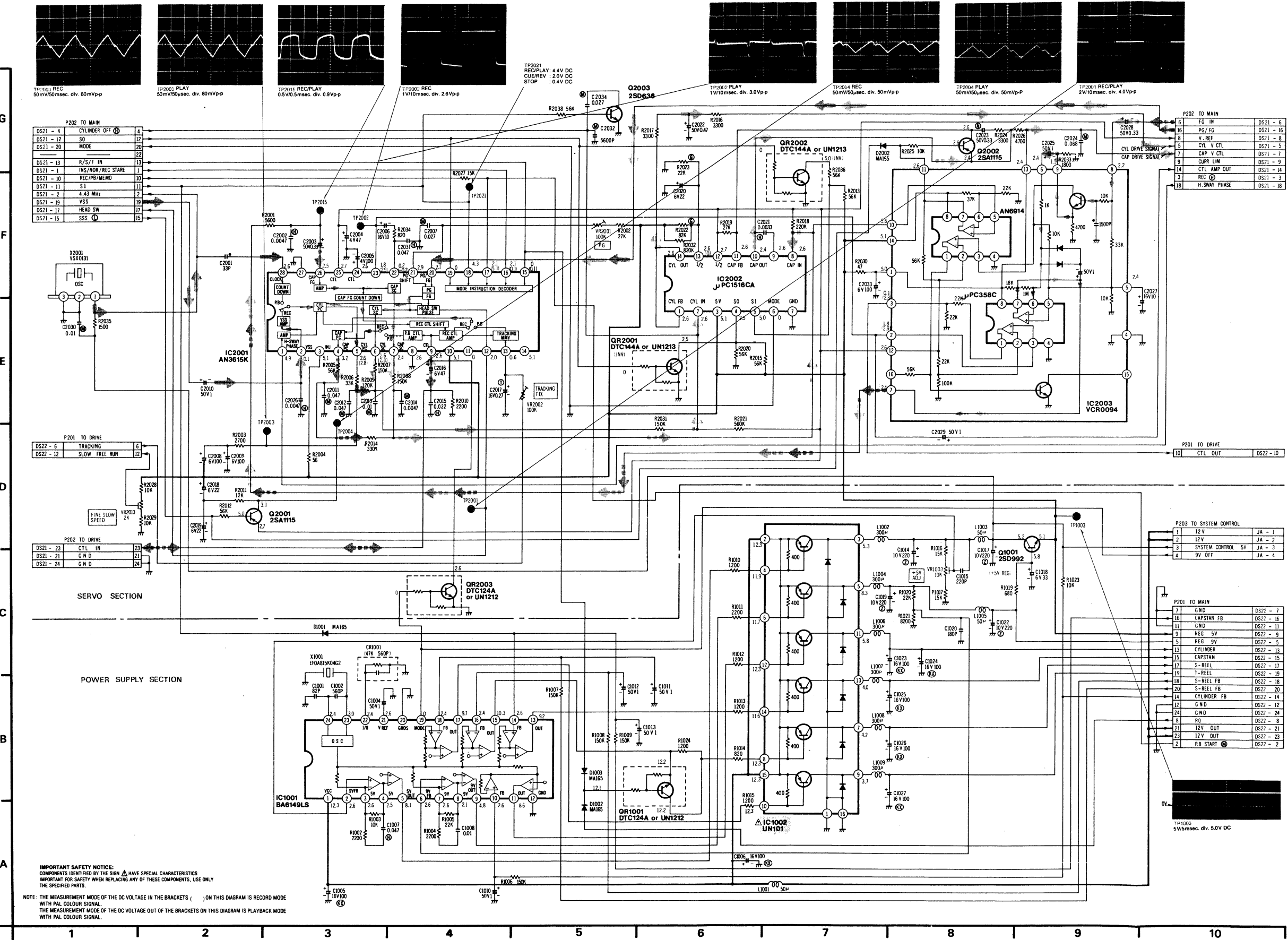
1	DATA (2)
2	GND
3	CLK (2)
4	5V

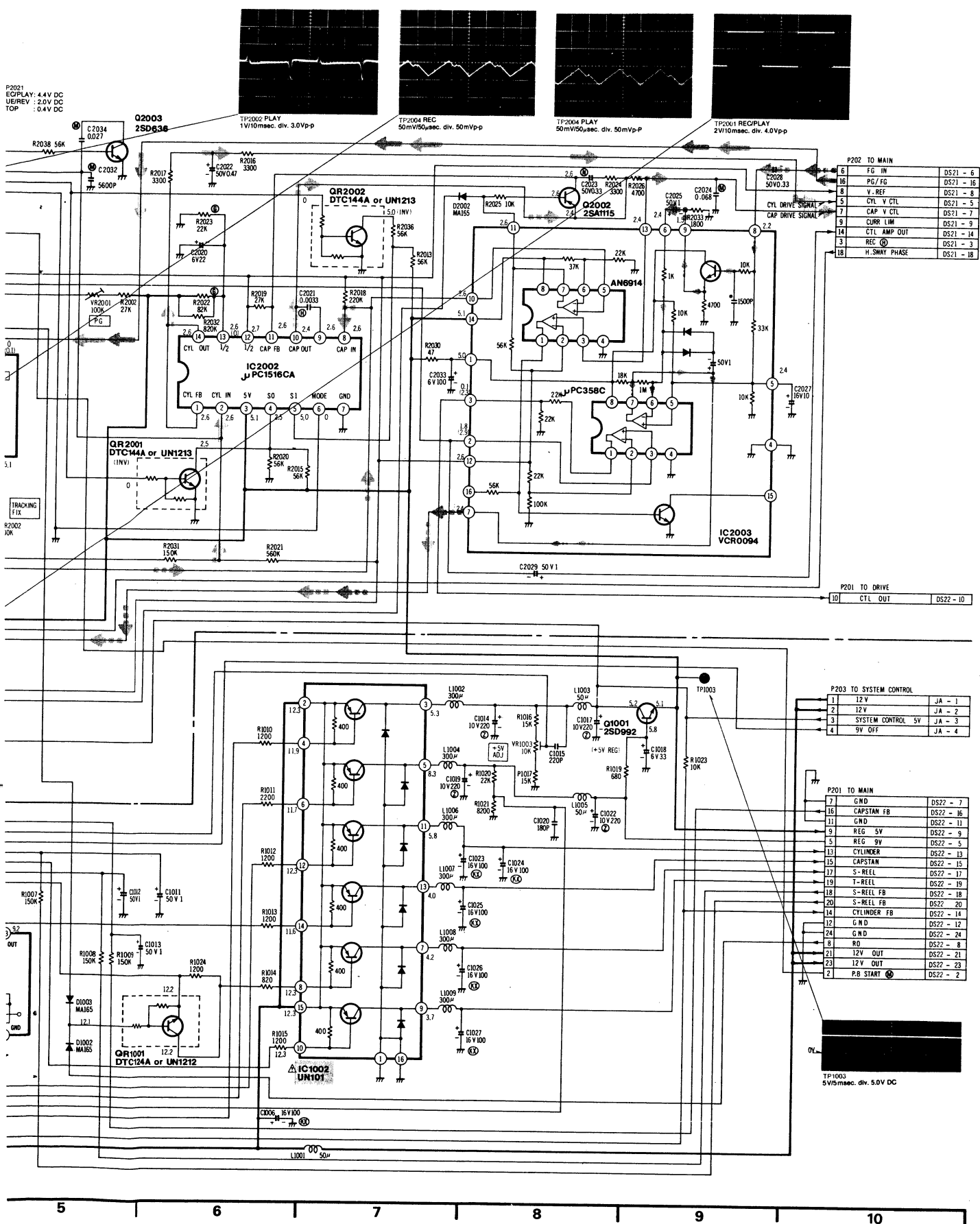
1	GND
2	12V

1	12V OUT
2	12V OUT
3	5V
4	9V OFF



3-9. SERVO (1) & POWER SUPPLY SCHEMATIC DIAGRAM



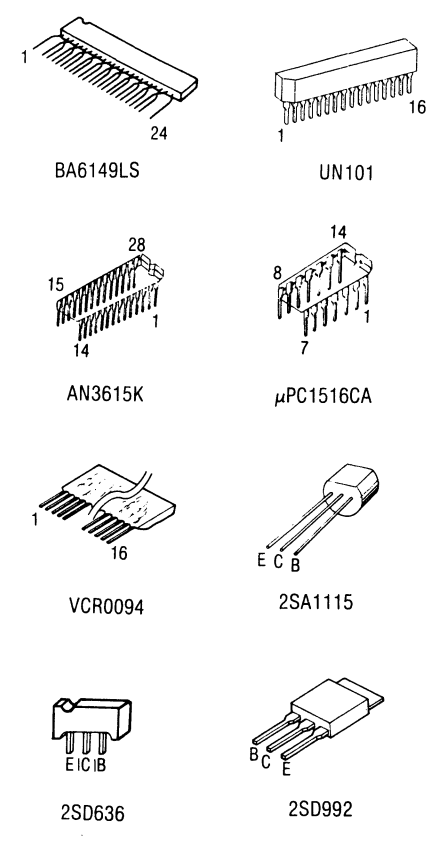


SERVO (1) & POWER SUPPLY SCHEMATIC			
Transistor			
Q1001	D-8		
Q2001	D-3		
Q2002	G-8		
Q2003	G-5		
Transistor & Resistor			
QR1001	A-6		
QR2001	E-5		
QR2002	G-7		
QR2003	C-4		
Integrated Circuit			
IC1001	B-3		
IC1002	A-7		
IC2001	E-2		
IC2002	F-6		
IC2003	E-9		
Test Point			
TP1003	D-9		
TP2001	D-4		
TP2002	F-3		
TP2003	D-2		
TP2004	D-3		
TP2015	F-3		
TP2021	F-4		
Adjustment			
VR1003	C-8		
VR2001	F-5		
VR2002	E-5		
VR2013	D-1		
Connector			
P201	C-10		
	D-1		
	D-10		
P202	D-1		
	G-1		
	G-10		
P203	D-10		

ADDRESS INFORMATION

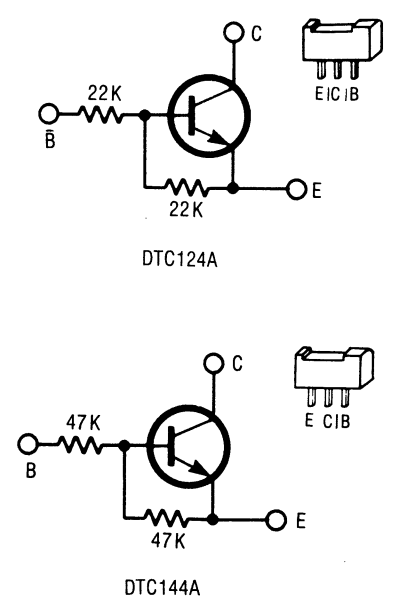
- ← CYLINDER SERVO PHASE LOOP
- ←... CAPSTAN SERVO PHASE LOOP
- ← CYLINDER SERVO SPEED LOOP
- ←... CAPSTAN SERVO SPEED LOOP

ICs & TRANSISTORS INFORMATION

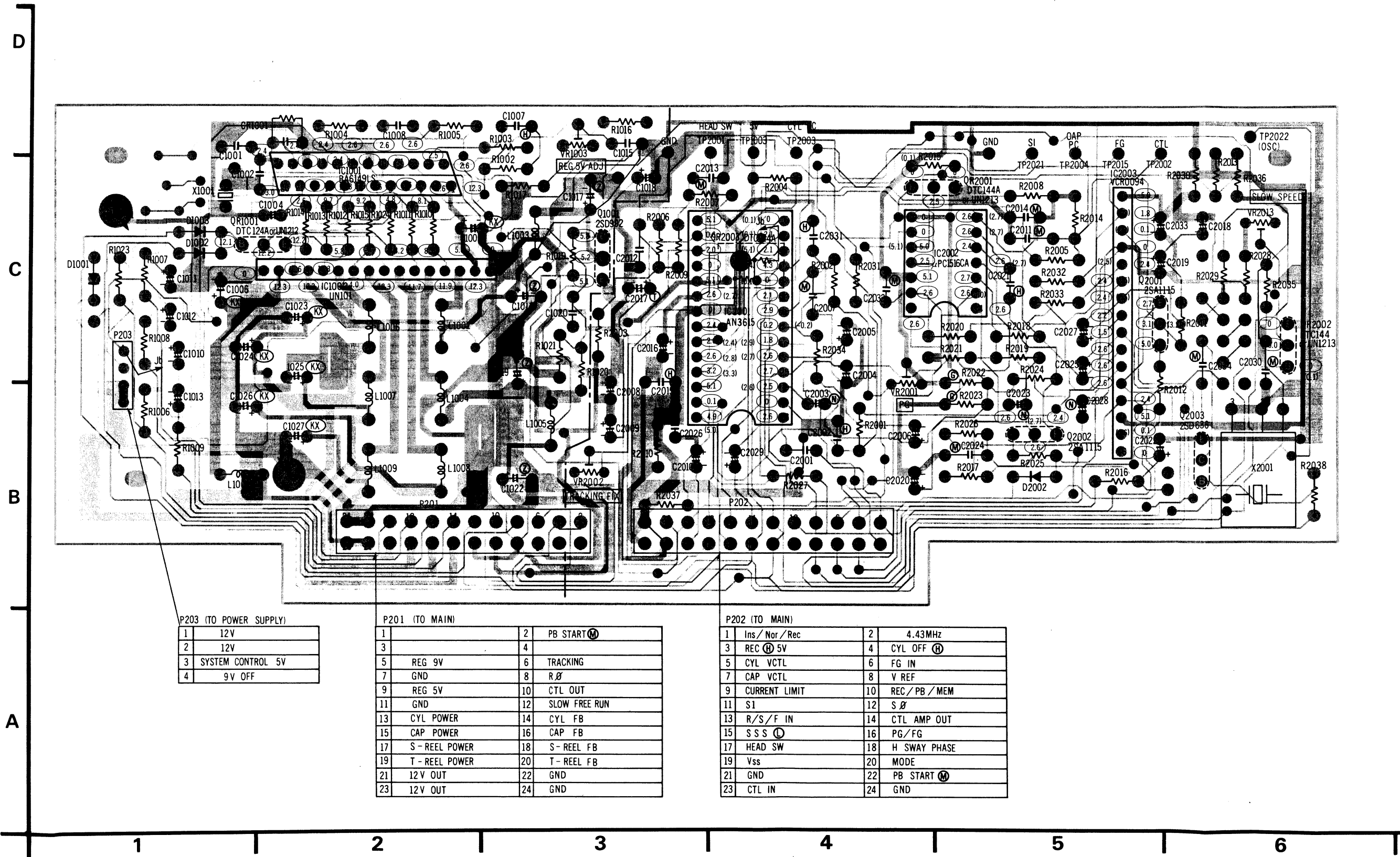


SERVO (1) & POWER SUPPLY CIRCUIT BOARD			
Transistor			
Q1001	C-3		
Q2001	C-5		
Q2002	B-5		
Q2003	B-6		
Transistor & Resistor			
QR1001	C-1		
QR2001	C-5		
QR2002	C-6		
QR2003	C-4		
Integrated Circuit			
IC1001	C-2		
IC1002	C-2		
IC2001	C-4		
IC2002	C-5		
IC2003	C-5		
Test Point			
TP1003	D-4		
TP2001	D-4		
TP2002	C-5		
TP2003	D-4		
TP2004	C-5		
TP2015	C-5		
TP2021	C-5		
TP GND	D-3		
TP GND	D-5		
Adjustment			
VR1003	D-3		
VR2001	C-4		
VR2002	B-3		
VR2013	C-6		

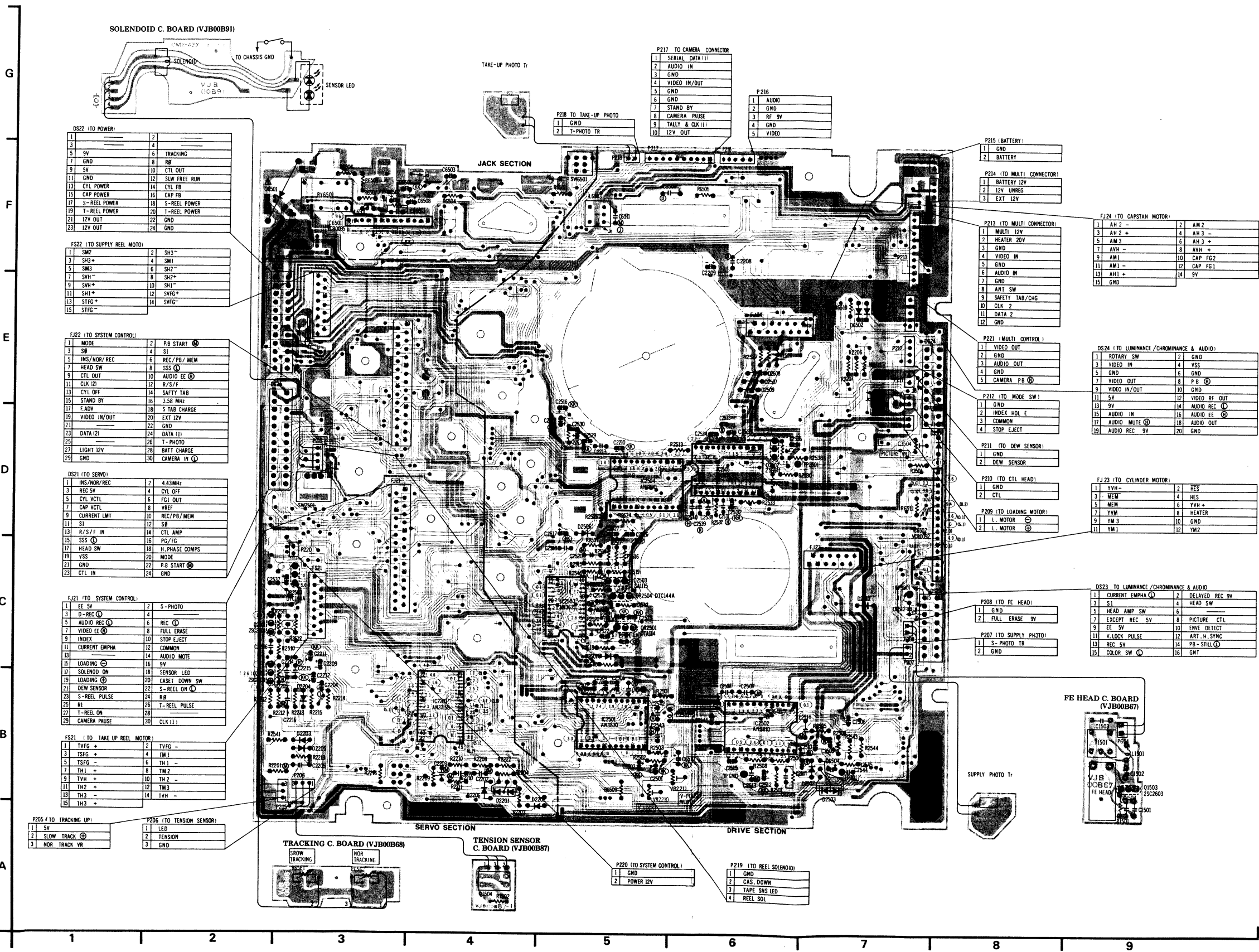
ADDRESS INFORMATION



3-10. SERVO (1) & POWER SUPPLY CIRCUIT BOARD (VEP02183A)



3-11. MAIN [Servo (2), Drive, Jack, Picture VR] CIRCUIT BOARD (VEP02184A)



MAIN [SERVO (2), DRIVE JACK & PICTURE VR] CIRCUIT BOARD			
Transistor			
Q1503	G-4		
Q2201	B-2		
Q2501	C-2		
Q2502	D-6		
Q2503	C-5		
Transistor & Resistor			
QR2501	C-5		
QR2503	C-3		
QR2504	C-5		
Integrated Circuit			
IC2201	B-4		
IC2501	B-5		
IC2502	B-6		
IC2503	B-5		
IC2504	D-5		
IC2505	D-6		
IC6501	F-3		
IC6502	D-7		
Test Point			
TP2501	D-7		
TP3017			
TP3501	C-7		
TP GND	B-6		
Adjustment			
R6561	A-3		
R6562	A-3		
VR2210	A-5		
VR2211	B-6		
VR3504	B-7		

ADDRESS INFORMATION

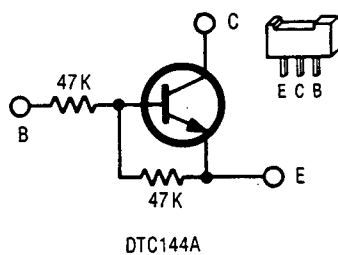
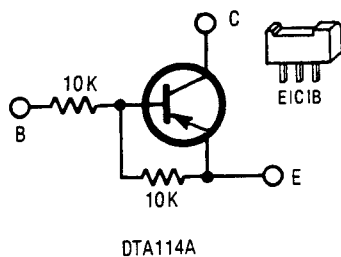
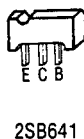
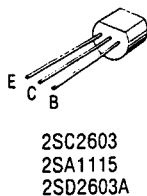
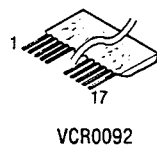
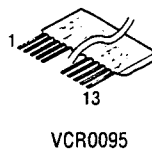
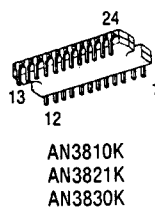
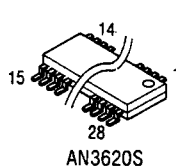
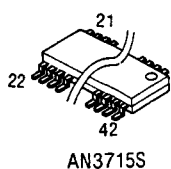
MAIN ICs DC VOLTAGE CHART

REF. NO.		IC2201																							
MODE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP		0	5.0	4.9	0	2.1	2.1	4.4	0.1	2.5	0.7	2.1	0.7	0	0	2.5	0	2.7	0.1	0.6	5.0	4.3	4.1	4.8	0.7
PLAY		4.5	2.1	0.1	5.0	0	0	0.1	2.6	2.5	1.1	2.2	1.1	0	0	2.5	0	2.7	0.1	1.1	5.0	2.5	4.8	4.8	0
REC		0.1	5.1	0.1	5.0	0.1	0	0.1	2.6	2.5	0.7	2.1	0.6	0	0	2.5	0	2.7	0.1	0.6	5.1	2.0	4.8	4.9	2.4
F.F		0	5.0	4.9	0	2.1	2.1	4.4	0.1	2.5	0.6	2.0	0.6	0	0	2.5	0	2.7	0.1	0.5	5.0	4.3	4.1	4.8	0.6
REW		0	5.0	4.9	0	2.1	2.1	4.4	0.1	2.5	0.8	2.2	0.8	0	0	2.5	0	2.7	0.1	0.8	5.0	4.3	4.1	4.8	0.6
REF. NO.		IC2201																							
MODE		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42						
STOP		1.6	1.6	0	2.9	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	2.1	0	0	0	5.1	0						
PLAY		1.6	1.6	0	2.9	2.3	3.1	2.7	2.3	0	2.5	1.7	0	2.1	0	0	2.0	5.1	0						
REC		1.6	1.6	0	2.9	2.4	3.1	2.7	2.4	5.1	2.5	1.8	0	2.0	0	0	2.0	5.1	0						
F.F		1.6	1.6	0	2.9	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	2.1	0	0	0	5.1	0						
REW		1.6	1.6	0	2.9	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	5.1	3.1	5.0	0	5.1	0						
REF. NO.		IC2501																							
MODE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP		1.5	0	1.5	2.4	1.9	1.8	1.8	1.9	1.9	1.9	0.1	5.1	5.1	3.1	5.0	0.2	4.9	0	5.0	0	0	0	1.5	3.6
PLAY		0.8	0	0.8	2.4	1.9	1.9	1.9	1.9	1.9	1.9	2.5	2.5	5.1	3.1	0.1	0	0.1	0.5	0	0	0.6	0.1	0.8	3.3
REC		0.8	0.1	0.8	2.4	1.9	1.9	1.9	1.9	1.9	1.9	2.5	2.5	5.1	3.1	0.1	0	0.1	0.5	0	0	0.6	0	0.8	3.3
F.F		1.9	0	1.9	2.4	1.9	1.9	1.9	1.9	1.9	1.9	2.6	2.5	5.1	3.1	0.1	0	4.9	0.5	0	0	0.6	0	1.9	4.2
REW		2.6	0.1	2.6	2.5	1.9	1.9	1.9	1.9	1.9	1.9	2.6	2.5	5.1	3.1	0.1	0.1	4.9	0.6	0	0	0.6	0.1	2.5	5.4
REF. NO.		IC2502																							
MODE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP		5.0	5.0	3.5	3.3	0.1	0	9.5	5.4	9.2	0.7	2.6	0	4.5	1.7	1.2	2.8	2.8	0	2.4	5.0	0	0	5.0	0
PLAY		5.3	5.3	3.5	3.3	0.1	0.1	9.5	2.4	8.3	0.9	2.7	0	2.6	1.4	1.3	2.7	2.7	0	2.1	5.6	0.1	0	5.3	0.1
REC		5.3	5.3	3.5	3.3	0.1	0.1	9.5	2.4	8.3	0.9	2.7	0	2.6	1.4	1.3	2.7	2.7	0	2.1	5.5	0.1	0	5.3	0.1
F.F		4.8	4.8	3.5	3.3	0	0	9.5	5.4	9.2	0.7	2.7	0	4.5	1.7	1.2	2.8	2.8	0	2.4	4.1	0	0	4.1	0
REW		4.8	4.8	3.5	3.3	0	0	9.5	5.4	9.2	0.7	2.6	0	4.5	1.7	1.2	2.8	2.7	0	2.4	5.7	0	0	5.6	0
REF. NO.		IC2503																							
MODE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP		1.2	1.3	0	0.3	0.3	0.3	0.3	0	2.1	5.0	2.2	2.9	5.1	0	0.3	0.1	0.1	5.0	0	2.6	0.2	0	2.6	3.2
PLAY		1.3	0	0	2.8	2.8	3.0	3.0	0	0	0	2.2	2.9	5.1	0.1	0	0.1	0.1	0.1	0.1	2.6	2.8	2.8	2.6	2.6
REC		1.3	1.3	0	2.9	2.8	3.1	3.0	0	0.1	0.1	2.2	2.9	5.1	0.1	0	0.1	0.1	0.1	0.1	2.6	2.8	2.8	2.7	2.6
F.F		1.3	1.3	0	2.3	2.2	0.3	0.4	0	0	5.0	2.2	2.9	5.1	0	0	0.1	0.1	0.1	0.1	2.6	0.2	0	2.6	3.2
REW		1.3	1.3	0	2.4	2.3	0.3	0.3	0	5.0	5.0	2.2	2.9	5.1	0.1	0.1	0.1	0	0.1	0	2.6	0.2	0	2.6	3.2
REF. NO.		IC2503																							
MODE		25	26	27	28																				
STOP		2.6	2.6	1.2	1.3																				
PLAY		2.6	2.6	1.3	1.3																				
REC		2.6	2.6	1.3	1.3																				
F.F		2.6	2.6	1.3	1.3																				
REW		2.6	2.6	1.3	1.3																				
REF. NO.		IC2504																							
MODE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP		1.6	0	1.6	2.4	1.9	2.0	2.0	1.9	1.9	1.9	0.1	0.1	5.1	3.1	5.0	0.1	4.9	0	5.0	0	0.1	0	1.6	3.5
PLAY		1.8	0.1	1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	5.1	3.1	0.1	0.1	0.1	0.5	0	0	0.6	0.1	1.8	3.9
REC		1.8	0.1	1.8	2.5	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	5.1	3.2	0.1	0.1	0.1	0.5	0	0	0.6	0.1	1.8	3.9
F.F		3.3	0.1	3.3	2.5	1.9	1.9	1.9	1.9	2.0	2.0	2.5	2.5	5.1	3.1	0.1	0.1	4.9	0.6	0	0	0.6	0.1	3.3	6.9
REW		2.3	0	2.3	2.4	1.9	1.9	1.9	1.9	2.0	2.0	2.6	2.5	5.1	3.1	0.1	0	4.9	0.4	0	0	0.5	0	2.7	5.9
REF. NO.		IC2505																							
MODE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP		2.6	0	2.6	0	1.6	1.5	1.4	1.6	1.5	1.5	2.1	0.1	5.1	3.1	2.5	0.7	4.9	0.5	0.4	0	0	0.1	2.6	12.3
PLAY		2.2	0.1	2.2	0	1.5	1.5	1.5	1.5	1.5	1.5	0	0	5.1	3.1	2.5	2.4	0.1	0.5	0.4	0.1	0	0.5	2.2	4.1
REC		2.2	0	2.2	0	1.5	1.5	1.5	1.5	1.5	1.5	0	0	5.1	3.1	2.5	2.4	0.1	0.5	0.4	0	0	0.5	2.2	4.1
F.F		2.6	0	2.6	0	1.6	1.5	1.4	1.6	1.5	1.5	2.1	0.3	5.1	3.1	2.5	0.6	4.9	0.5	0.4	0	0	0.1	0	12.2
REW		2.6	0	2.6	0	1.6	1.5	1.4	1.6	1.5	1.5	2.1	0.3	5.1	3.1	2.5	0.7	4.9	0.5	0.4	0	0	0.1	2.6	12.1
REF. NO.		IC6501																							
MODE		1	2	3	4	5	6	7	8	9	10	11	12	13											
STOP		9.6	12.4	4.6	4.2	0.2	9.6	0	9.6	3.3	0.5	1.0	6.6	0											
PLAY		9.6	12.4	0	4.2	0.2	9.6	0	9.6	3.2	0.5	1.0	6.6	0											
REC		9.6	12.4	0.1	4.2	0.2	9.6	0	9.6	3.3	0.5	1.0	6.6	0											
F.F		9.6	12.4	4.6	4.2	0.2	9.6	0	9.6	3.3	0.5	1.0	6.6	0											
REW		9.6	12.4	4.6	4.2	0.2	9.6	0	9.6	3.3	0.5	1.0	6.6	0											
REF. NO.		IC6502																							
MODE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17							
STOP		0	-0.1	0	5.1	5.1	4.6	4.9	5.0	5.0	9.6	0	9.3	0.2	9.6	0	9.6	0.7							
PLAY		0	-0.1	0	5.1	0.3	4.6	4.9	0	0	9.6	0	9.4	0.3	9.6	0.3	9.6	0.7							
REC		0	5.1	0	5.1	2.5	0.1	0.1	5.0	5.1	0.1	9.5	0.2	9.5	3.3	9.6	0.6	0.7							
F.F		0	-0.1	0	5.1	5.1	4.6	4.9	5.0	5.0	9.6	0	9.3	0.1	9.6	0.1	9.6	0.7							
REW		0	-0.1	0	5.0	5.1	4.6	4.9	5.0	5.0	9.6	0	9.3	0	9.6	0.1	9.6	0							

MAIN TRANSISTORS DC VOLTAGE CHART

REF. NO.	Q2201								
MODE	E	C	B						
STOP	0	4.4	0						
PLAY	0	2.6	0						
REC	0	2.6	0						
F.F	0	4.4	0						
REW	0	4.4	0						
REF. NO.	Q2501			Q2502			Q2503		
MODE	E	C	B	E	C	B	E	C	B
STOP	0	4.3	0	7.7	7.6	7.0	5.1	4.6	5.0
PLAY	1.8	4.3	2.5	2.8	2.6	2.2	5.1	5.1	4.5
REC	1.8	4.3	2.5	2.8	2.6	2.3	5.1	5.1	4.5
F.F	1.8	4.3	2.5	7.6	7.6	7.0	5.1	5.2	4.9
REW	1.8	4.3	2.5	7.6	7.6	7.0	5.1	3.7	4.9
REF. NO.	QR2501			QR2503			QR2504		
MODE	E	C	B	E	C	B	E	C	B
STOP	5.1	2.4	5.0	0	5.1	0	0	0	5.0
PLAY	5.1	5.1	3.9	0	0	5.0	0	2.8	0
REC	5.1	5.1	4.0	0	0	5.0	0	2.7	0
F.F	5.1	2.9	5.0	0	5.1	0	0	0	5.0
REW	5.1	2.9	5.0	0	5.1	0	0	0	5.0

ICs & TRANSISTORS INFORMATION



MAIN [SERVO (2), DRIVE, JACK & PICTURE VR] SCHEMATIC

Transistor

Q1503	E-21
Q2201	E-5
Q2501	E-11
Q2502	C-13
Q2503	B-7

Transistor & Resistor

QR2501	A-6
QR2503	H-7
QR2504	A-7

Integrated Circuit

IC2201	H-6
IC2501	G-10
IC2502	F-12
IC2503	C-5
IC2504	C-8
IC2505	C-14
IC6501	H-17
IC6502	E-16

Test Point

TP2501	B-16
TP3017	B-7
TP3501	B-5
TP GND	D-17

Adjustment

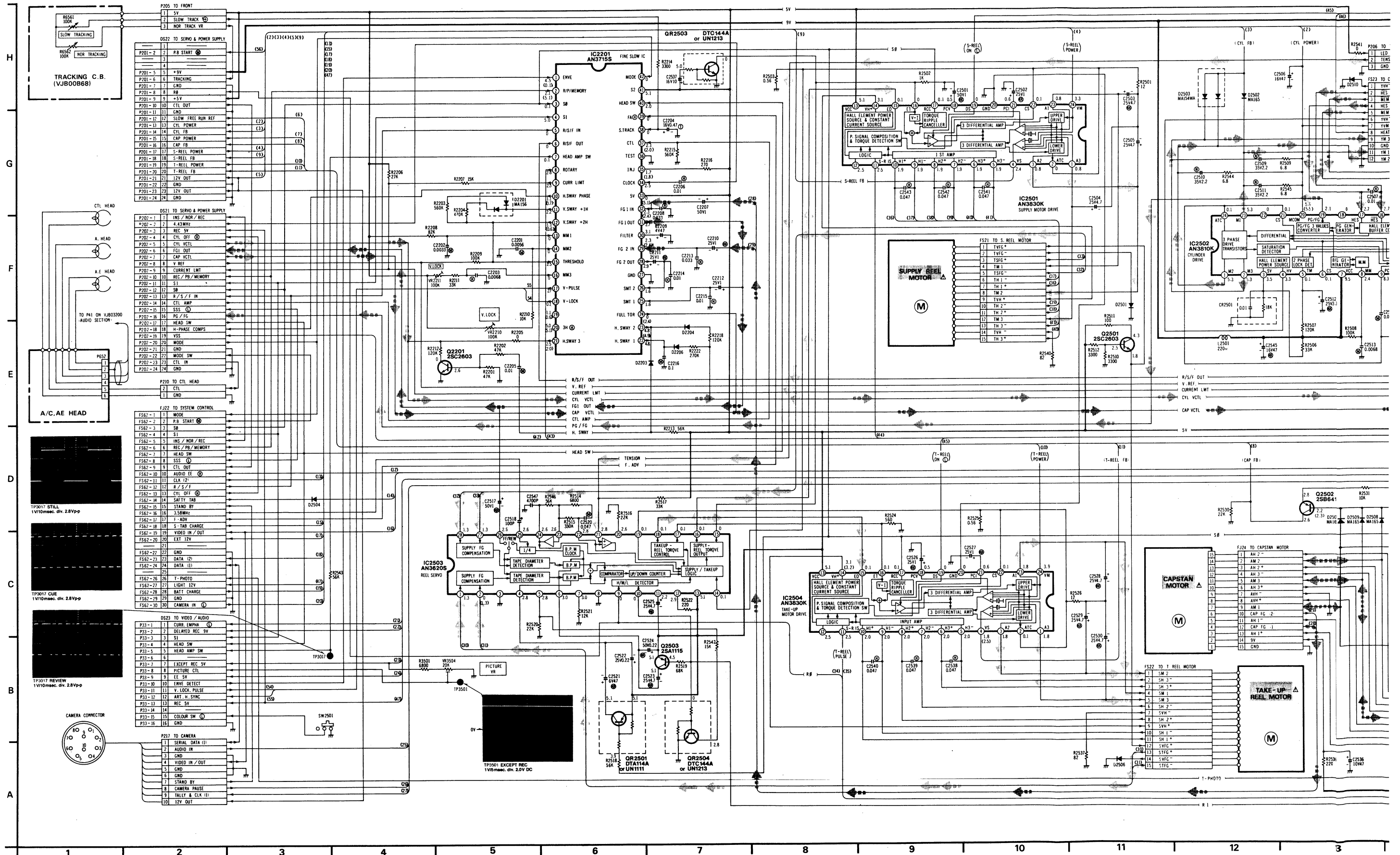
R6561	H-1
R6562	H-1
VR2210	E-5
VR2211	F-5
VR3504	B-5

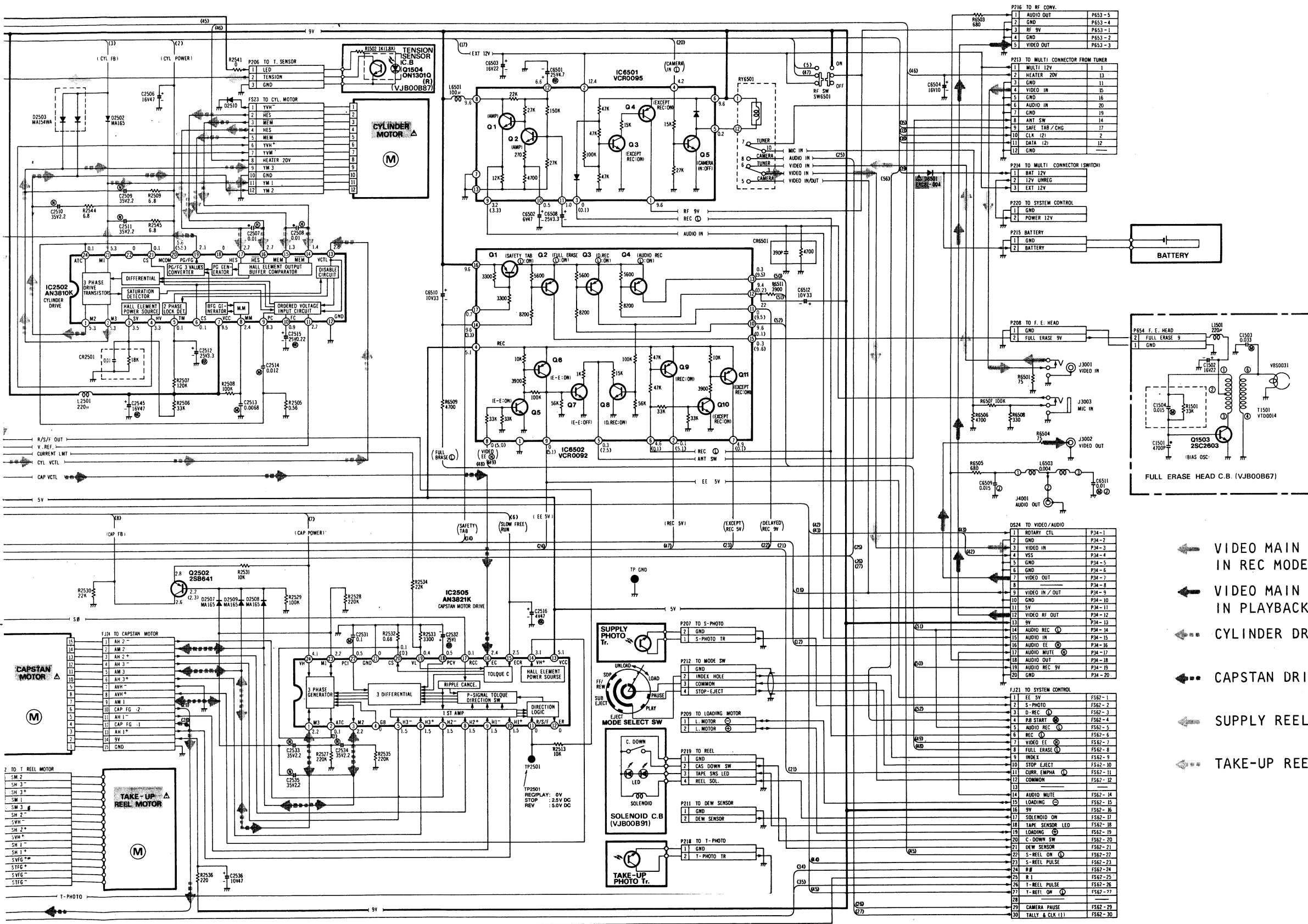
Connector

DS21	F-2
DS22	H-2
DS23	C-2
DS24	D-20
FJ21	C-20
FJ22	E-2
FJ24	C-12
FS21	F-10
FS22	B-11
FS23	H-23
P205	H-2
P206	H-13
P207	C-17
P208	F-20
P209	C-17
P210	E-2
P211	B-17
P212	C-17
P213	H-20
P214	G-20
P215	G-20
P216	H-20
P217	A-2
P218	A-17
P219	B-17
P220	G-20
P221	F-20
P654	F-21

ADDRESS INFORMATION

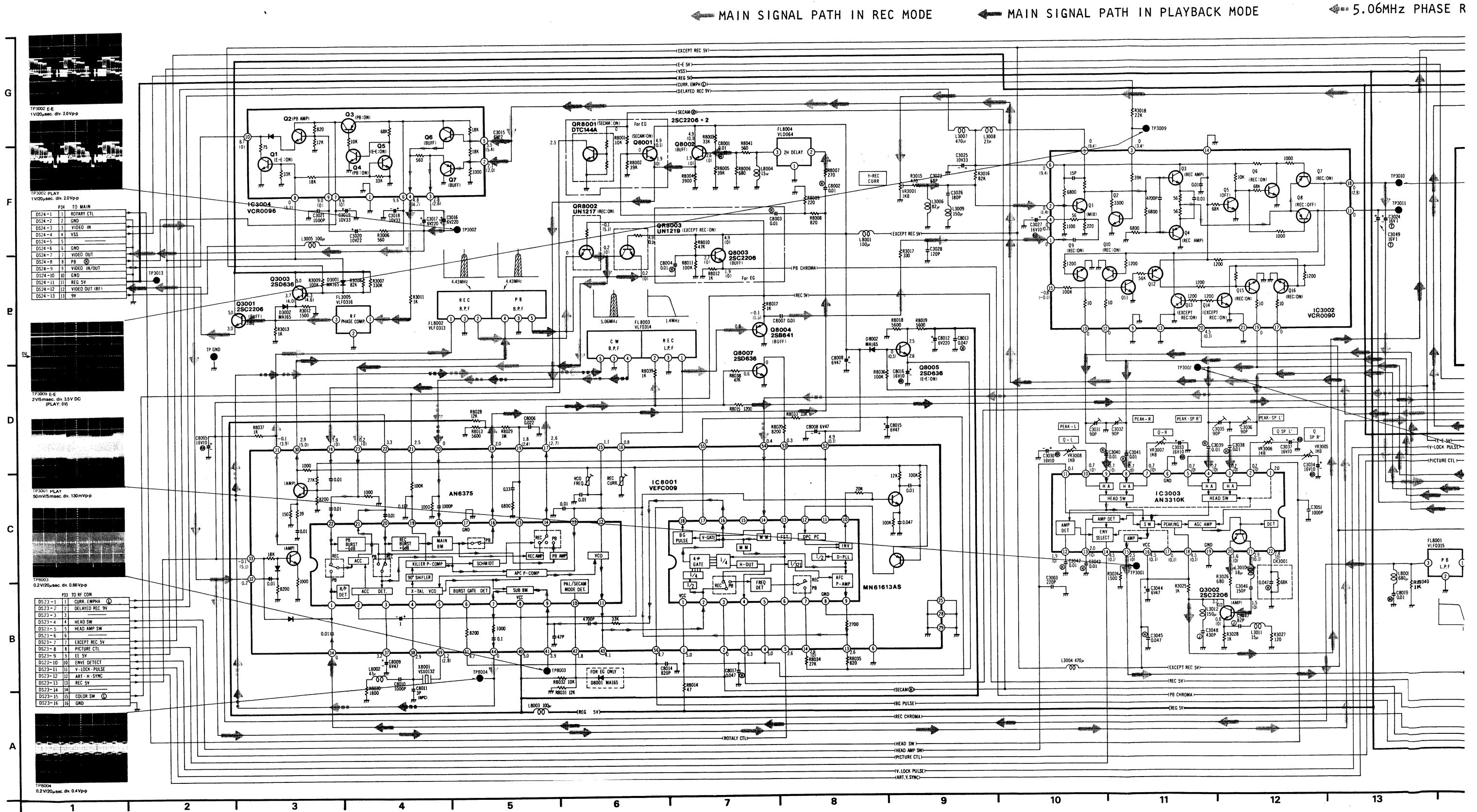
3-12. MAIN [Servo (2), Drive, Jack, Picture VR] SCHEMATIC DIAGRAM





NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL.
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.

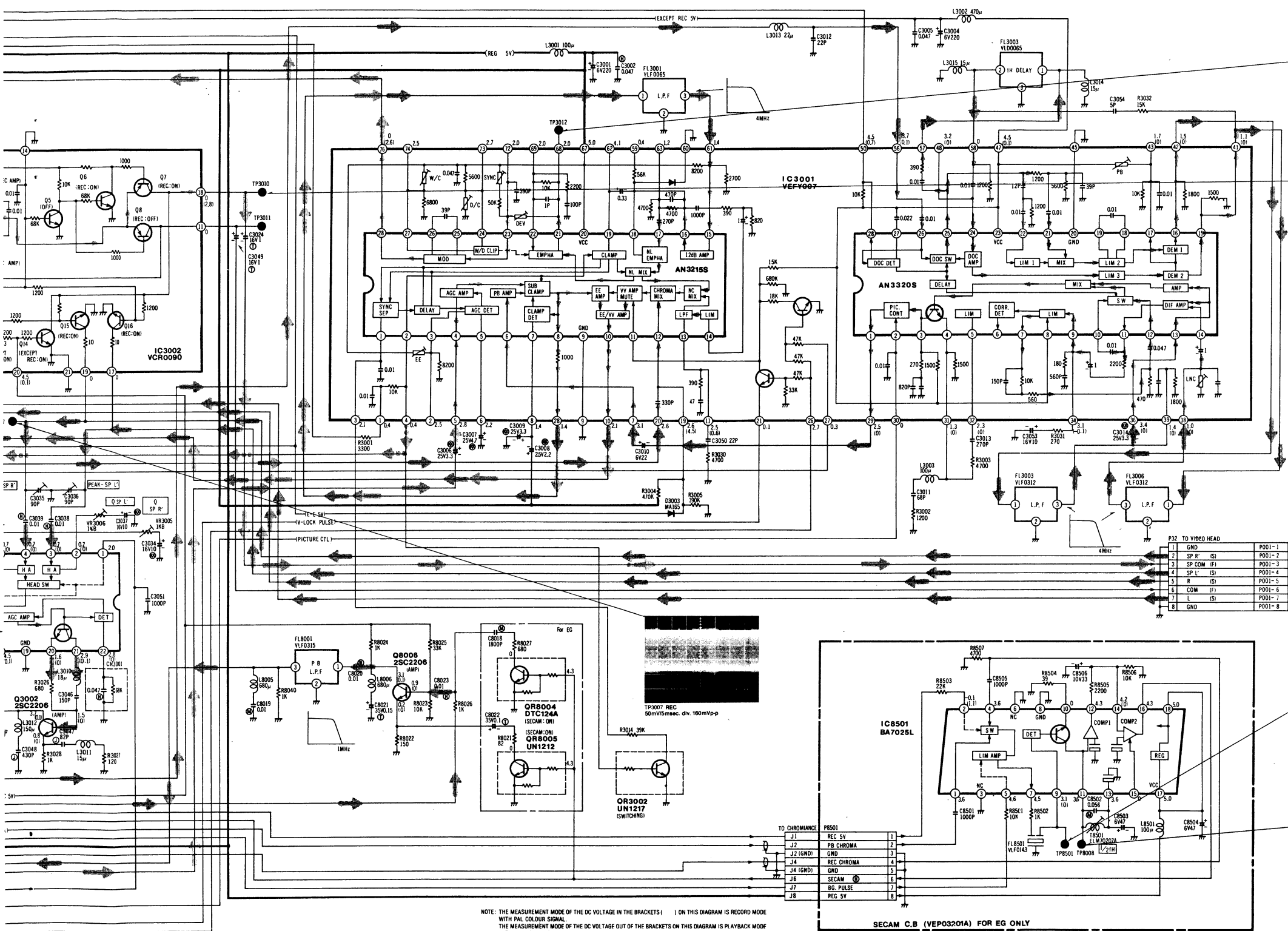
3-13. LUMINANCE & CHROMINANCE SCHEMATIC DIAGRAM



BACK MODE

5.06MHz PHASE ROTATIONAL SIGNAL IN REC MODE

5.06MHz PHASE ROTATIONAL SIGNAL IN PLAYBACK MODE



NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL. THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL. (THE VOLTAGES OF THE PARTS FOR EG ARE MEASURED WITH SECAM COLOUR SIGNAL.)

SECAM C.B (VEP03201A) FOR EG ONLY

LUMINANCE & CHROMINANCE SCHEMATIC

Transistor	
Q3001	E-3
Q3002	B-11
Q3003	E-3
Q8001	F-6
Q8002	F-7
Q8003	F-7
Q8004	E-8
Q8005	D-9
Q8006	B-14
Q8007	D-7

Transistor & Resistor	
QR3002	B-16
QR8001	G-6
QR8002	F-6
QR8003	F-6
QR8004	B-15
QR8005	B-15

Integrated Circuit	
IC3001	F-17
IC3002	E-12
IC3003	C-11
IC3004	F-3
IC8001	C-6
IC8501	B-18

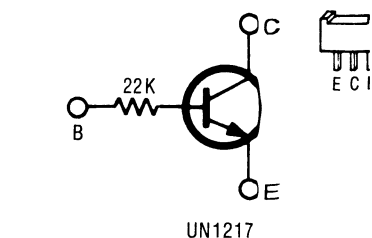
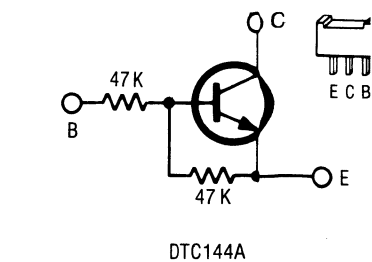
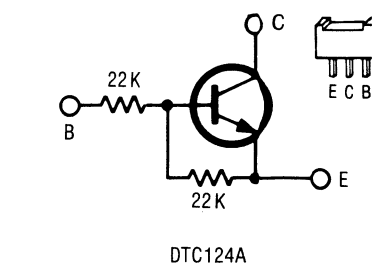
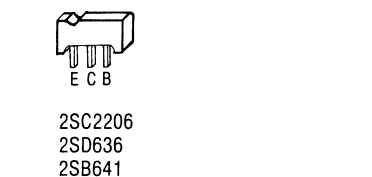
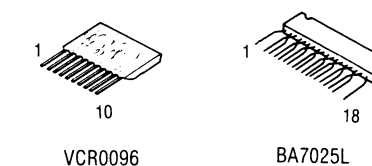
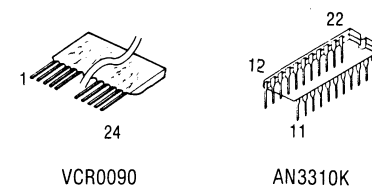
Test Point	
TP3001	C-11
TP3002	F-5
TP3007	D-11
TP3009	G-11
TP3010	F-13
TP3011	F-13
TP3012	G-15
TP3013	E-2
TP8003	B-5
TP8004	B-5
TP8008	A-19
TP8501	A-19
TP GND	E-2

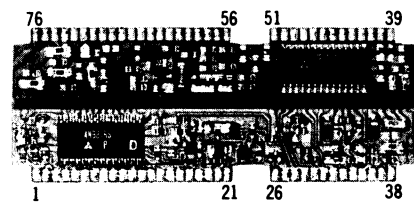
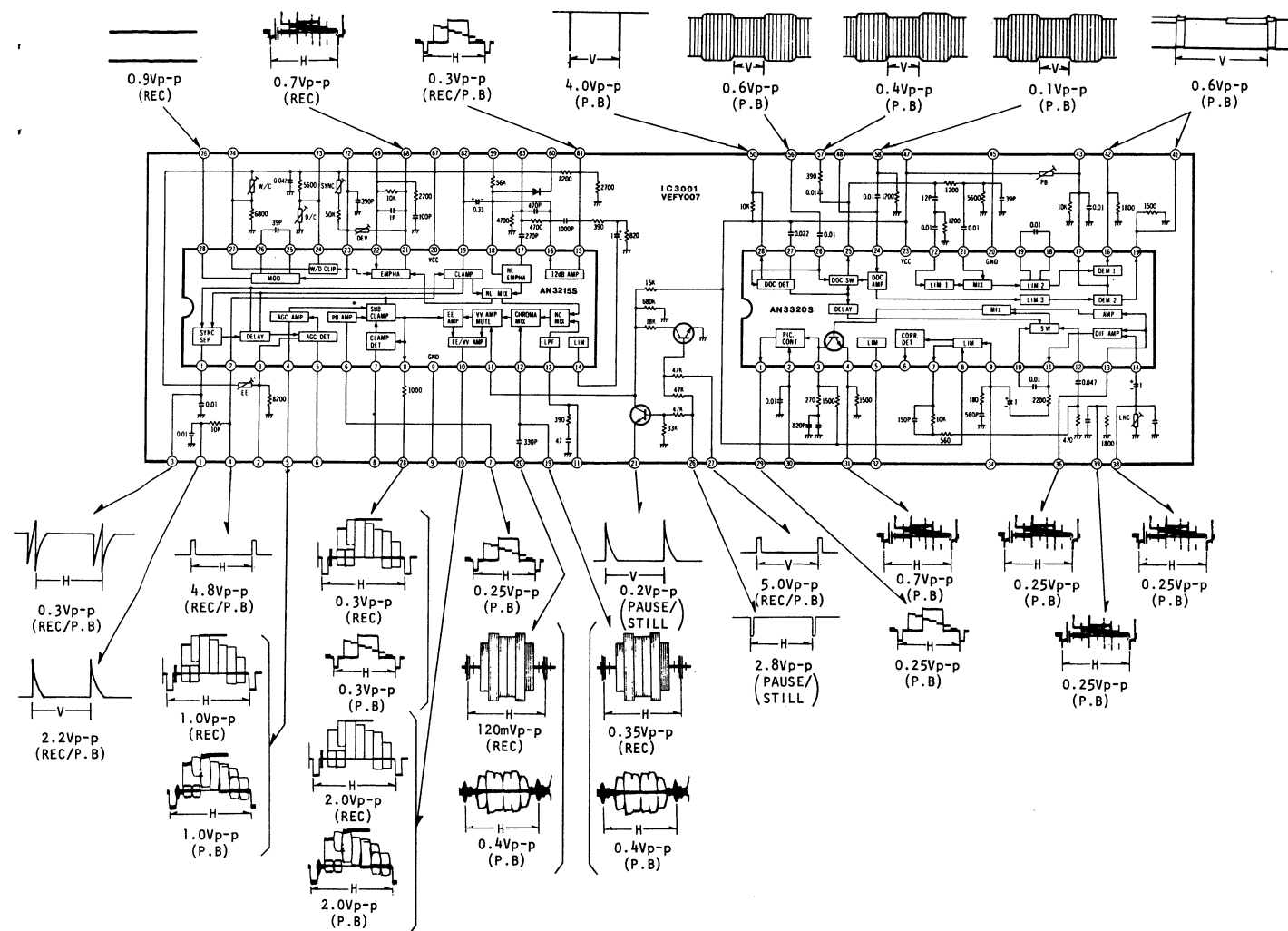
Adjustment	
C3031	D-10
C3032	D-11
C3035	D-11
C3036	D-12
VR3001	F-9
VR3005	D-12
VR3006	D-12
VR3007	D-11
VR3008	D-11
T8501	A-19

Connector	
P32	D-20
P33	B-1
P34	F-1
P8501	A-17

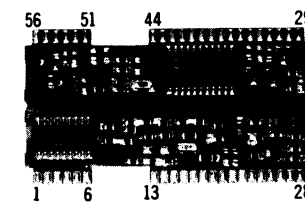
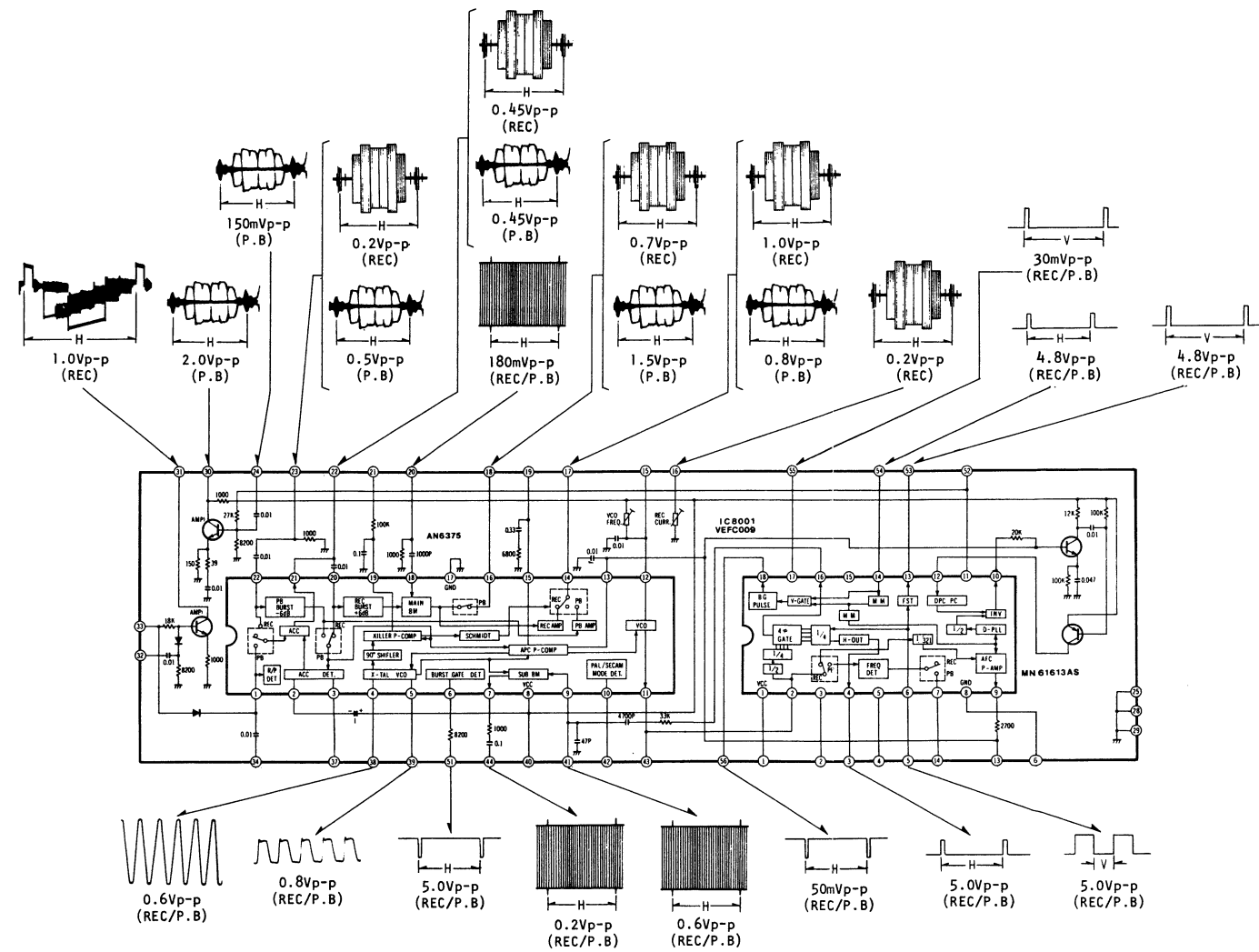
ADDRESS INFORMATION

ICs & TRANSISTORS INFORMATION

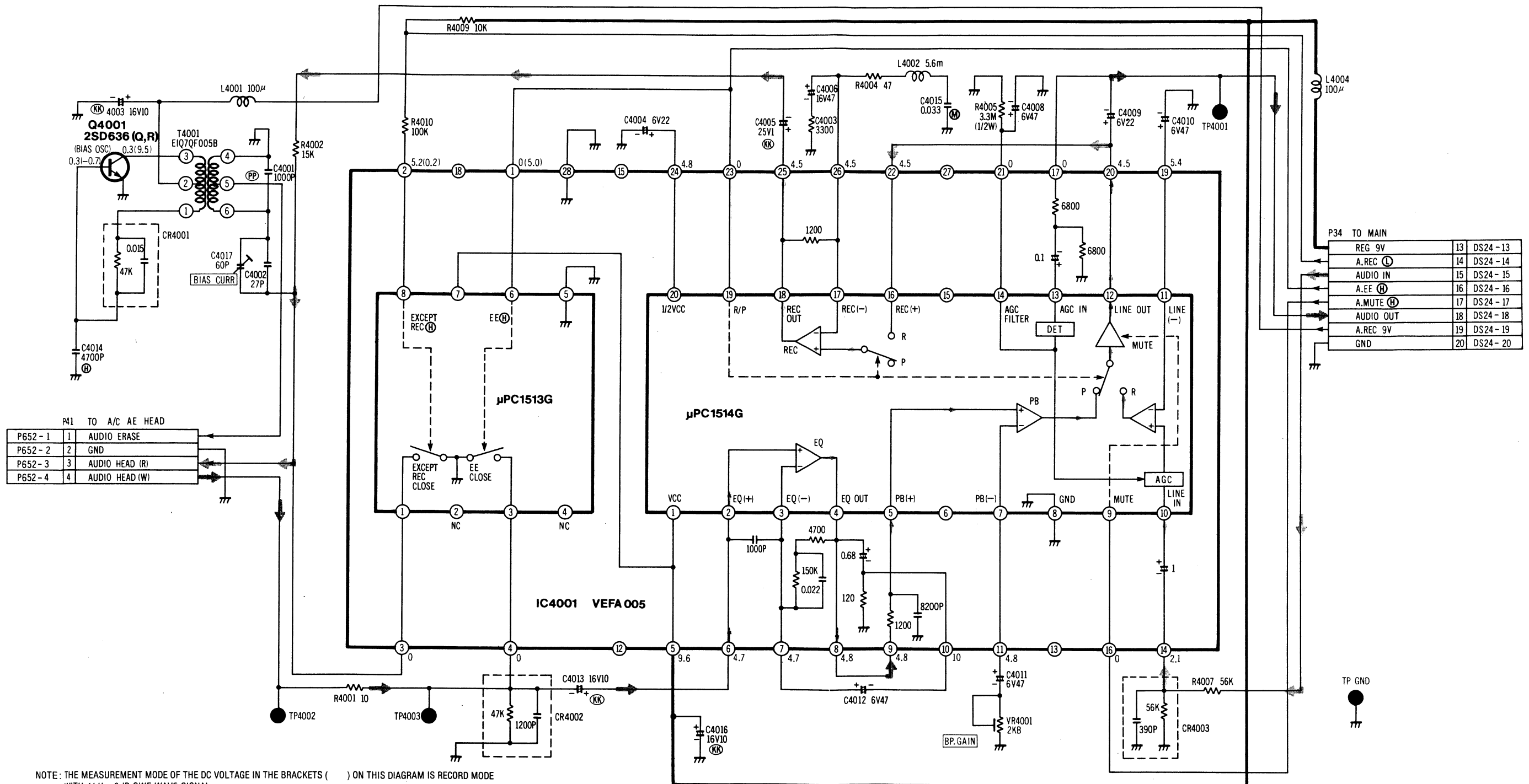




VEFY007

**VEFC009**

3-14. AUDIO SCHEMATIC DIAGRAM

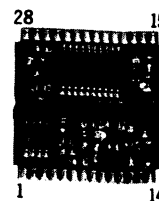


NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH 1 kHz, 0dB SINE WAVE SIGNAL.
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH 1 kHz, 0dB SINE WAVE SIGNAL.

ICs & TRANSISTORS INFORMATION



2SD636



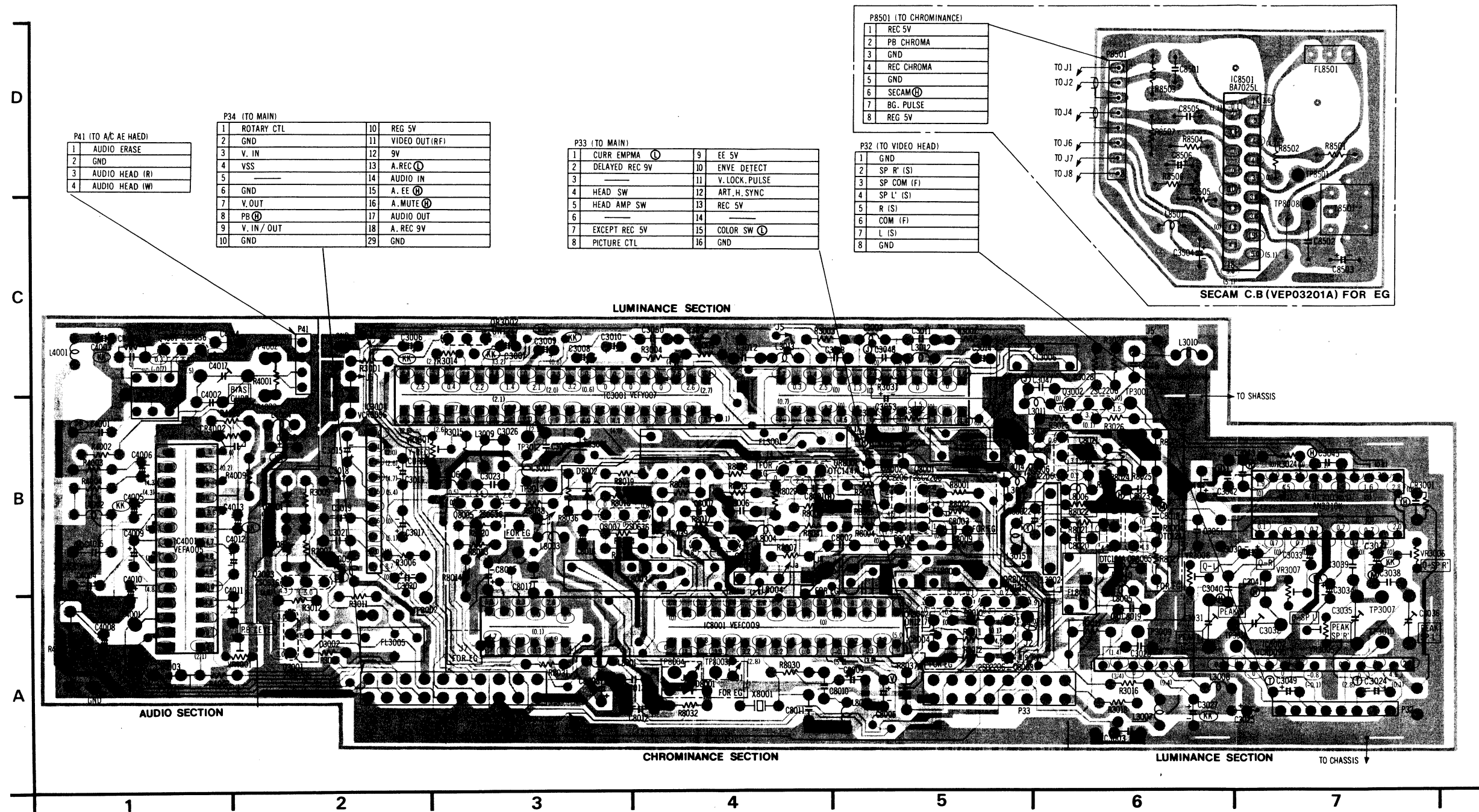
← MAIN SIGNAL PATH IN REC MODE

← MAIN SIGNAL PATH IN PLAYBACK MODE

Back Page:
LUMINANCE, CHROMINANCE Section

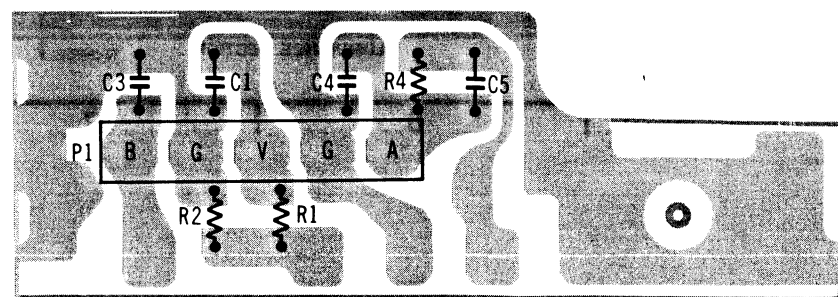
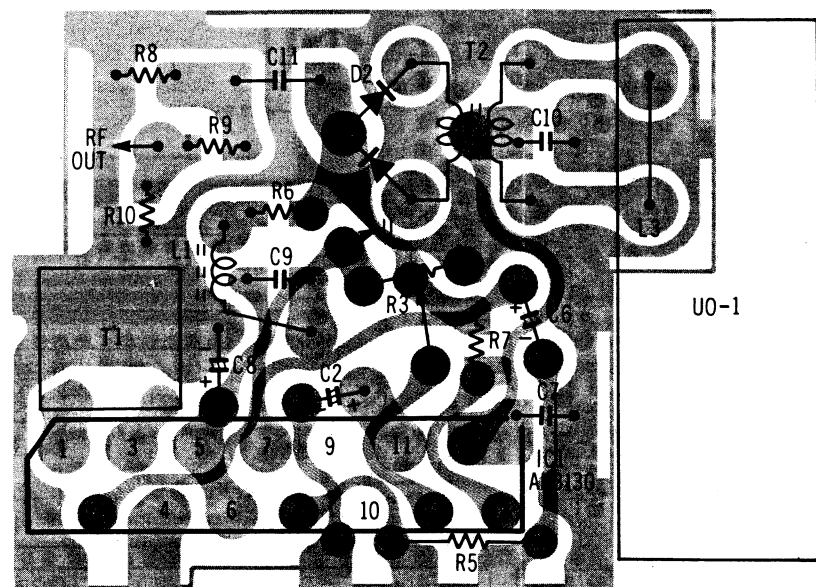
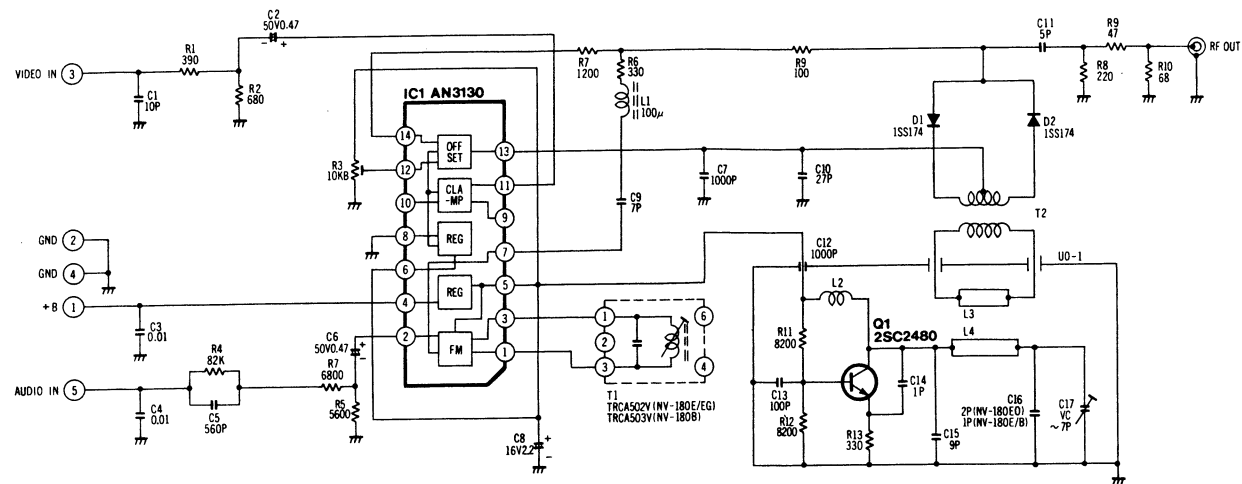
3-15. LUMINANCE, CHROMINANCE & AUDIO CIRCUIT BOARD (VEP03200A: NV-180E/B)/(VEP03200B: NV-180 EG) /SECAM CIRCUIT BOARD (VEP03201A)

LUMINANCE CHROMINANCE & AUDIO CIRCUIT BOARD	
Transistor	
Q3001	A-2
Q3002	C-6
Q3003	B-2
Q4001	C-1
Q8001	B-5
Q8002	B-5
Q8003	A-5
Q8004	B-4
Q8005	B-3
Q8006	B-6
Q8007	B-3
Transistor & Resistor	
QR3002	C-3
QR8001	B-5
QR8002	A-5
QR8003	A-5
QR8004	B-6
QR8005	B-6
Integrated Circuit	
IC3001	C-3
IC3002	A-7
IC3003	B-7
IC3004	B-2
IC4001	B-1
IC8001	A-4
IC8501	D-6
Test Point	
TP3001	C-6
TP3002	A-2
TP3007	B-7
TP3009	A-6
TP3010	B-7
TP3011	A-6
TP3012	B-3
TP3013	B-3
TP4001	A-1
TP4002	C-2
TP4003	C-2
TP8003	A-4
TP8004	A-4
TP8008	D-7
TP8501	D-7
TP GND	C-2
TP GND	A-1
Adjustment	
C3031	A-6
C3032	A-7
C3035	B-7
C3036	B-7
C4017	C-1
VR3001	B-2
VR3005	A-7
VR3006	B-7
VR3007	B-7
VR3008	B-6
VR4001	A-2
T8501	D-7



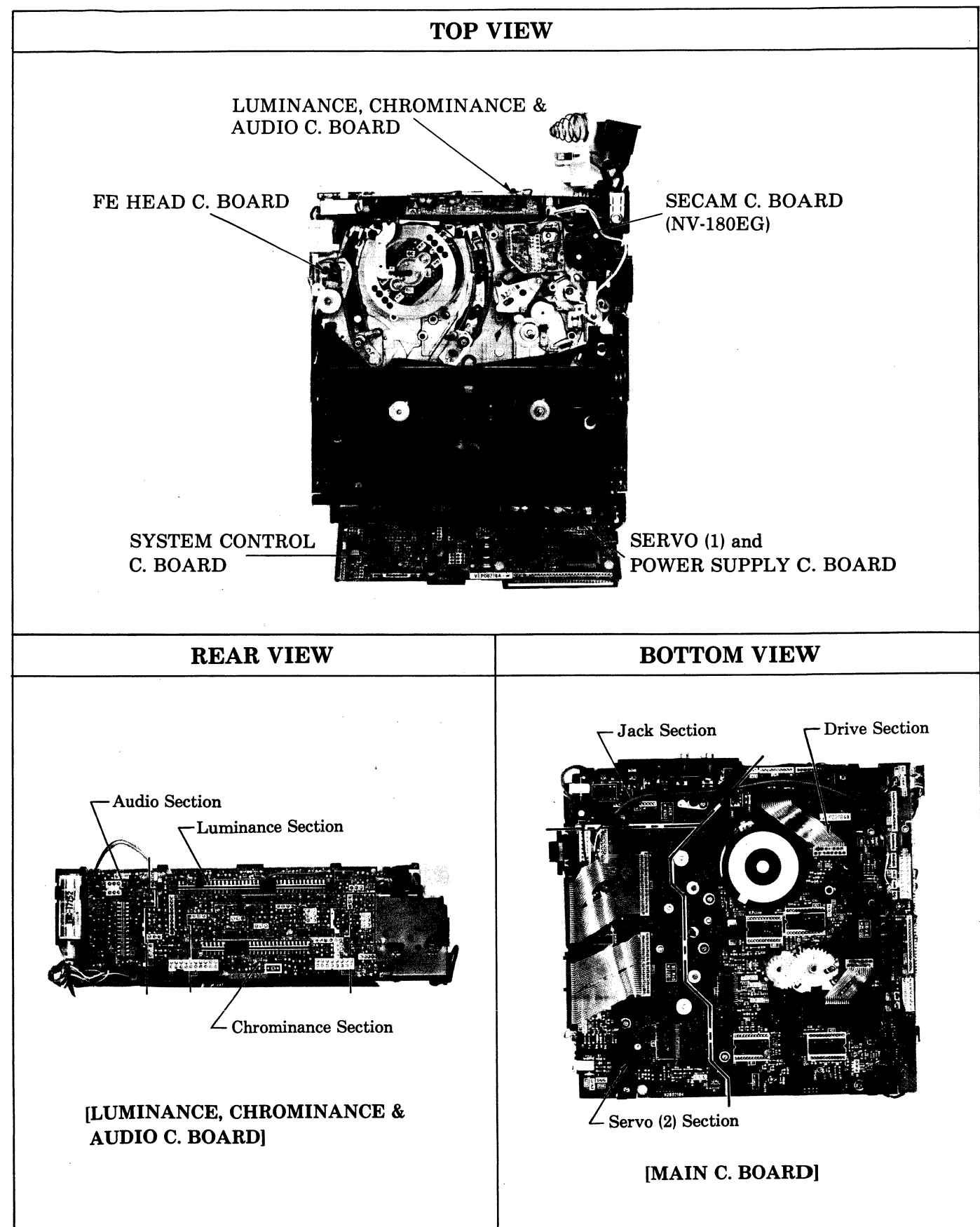
ADDRESS INFORMATION

3-16. RF CONVERTER SCHEMATIC DIAGRAM & CIRCUIT BOARD
 —UNIT No. ENC17751— —UNIT No. ENC17752—

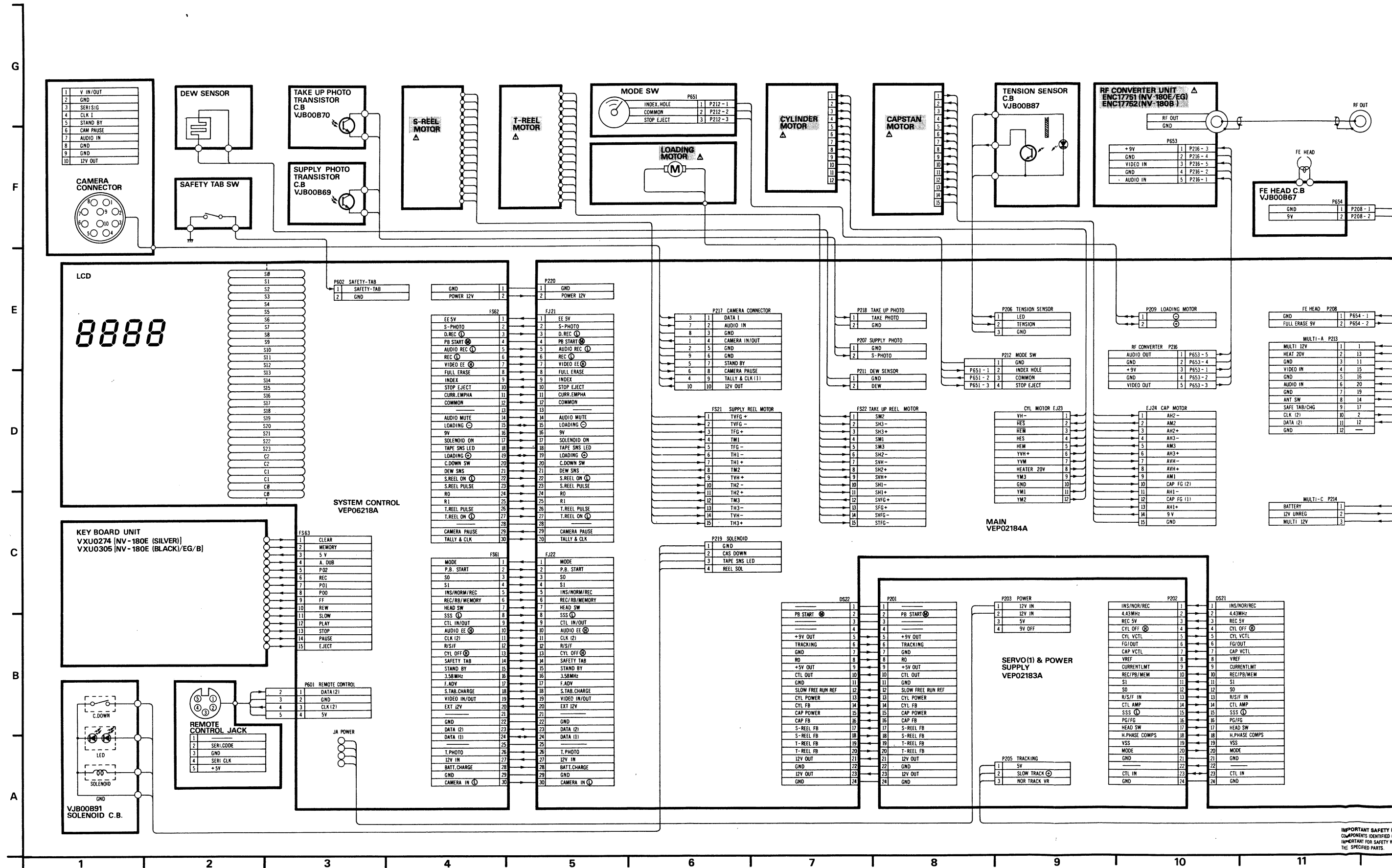


Back Page:
 LUMINANCE, CHROMINANCE &
 AUDIO Section

3-17. CIRCUIT BOARD LAYOUT



3-18. INTERCONNECTION SCHEMATIC DIAGRAM



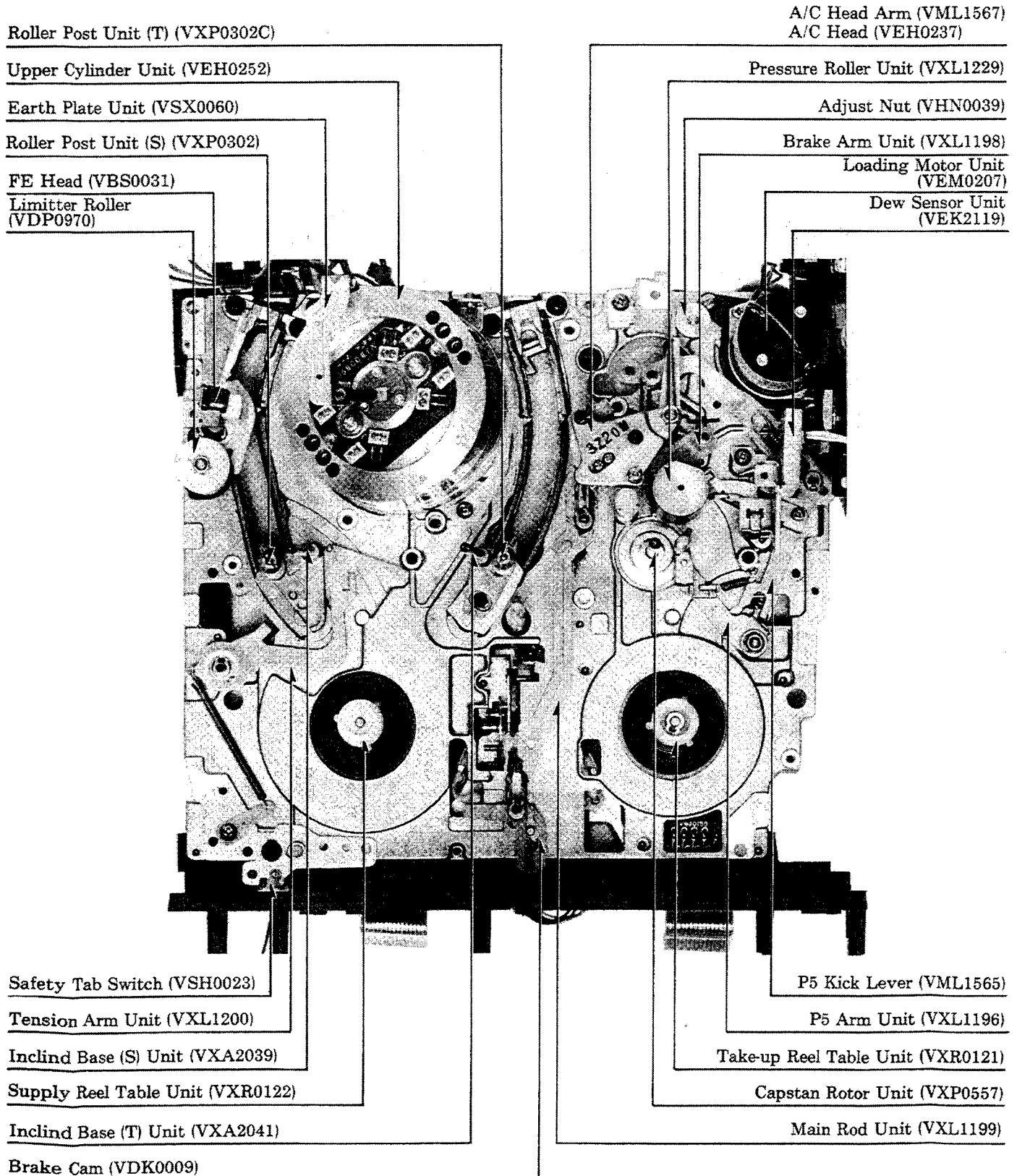
IMPORTANT SAFETY I
COMPONENTS IDENTIFIED I
IMPORTANT FOR SAFETY V
THE SPECIFIED PARTS.



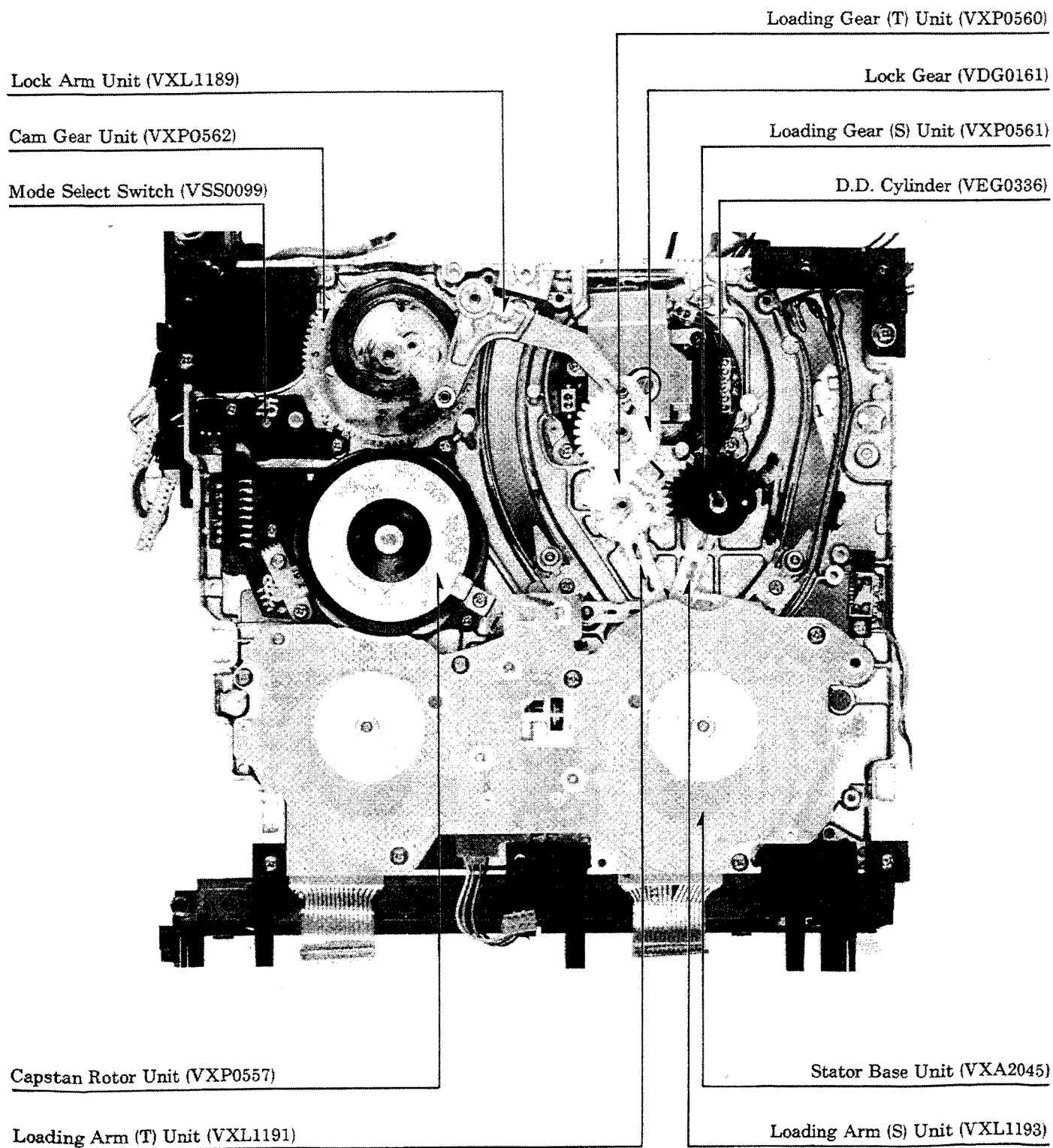
SECTION 4 EXPLODED VIEWS AND PARTS LIST

4.1. INNER PARTS LOCATION

TOP VIEW

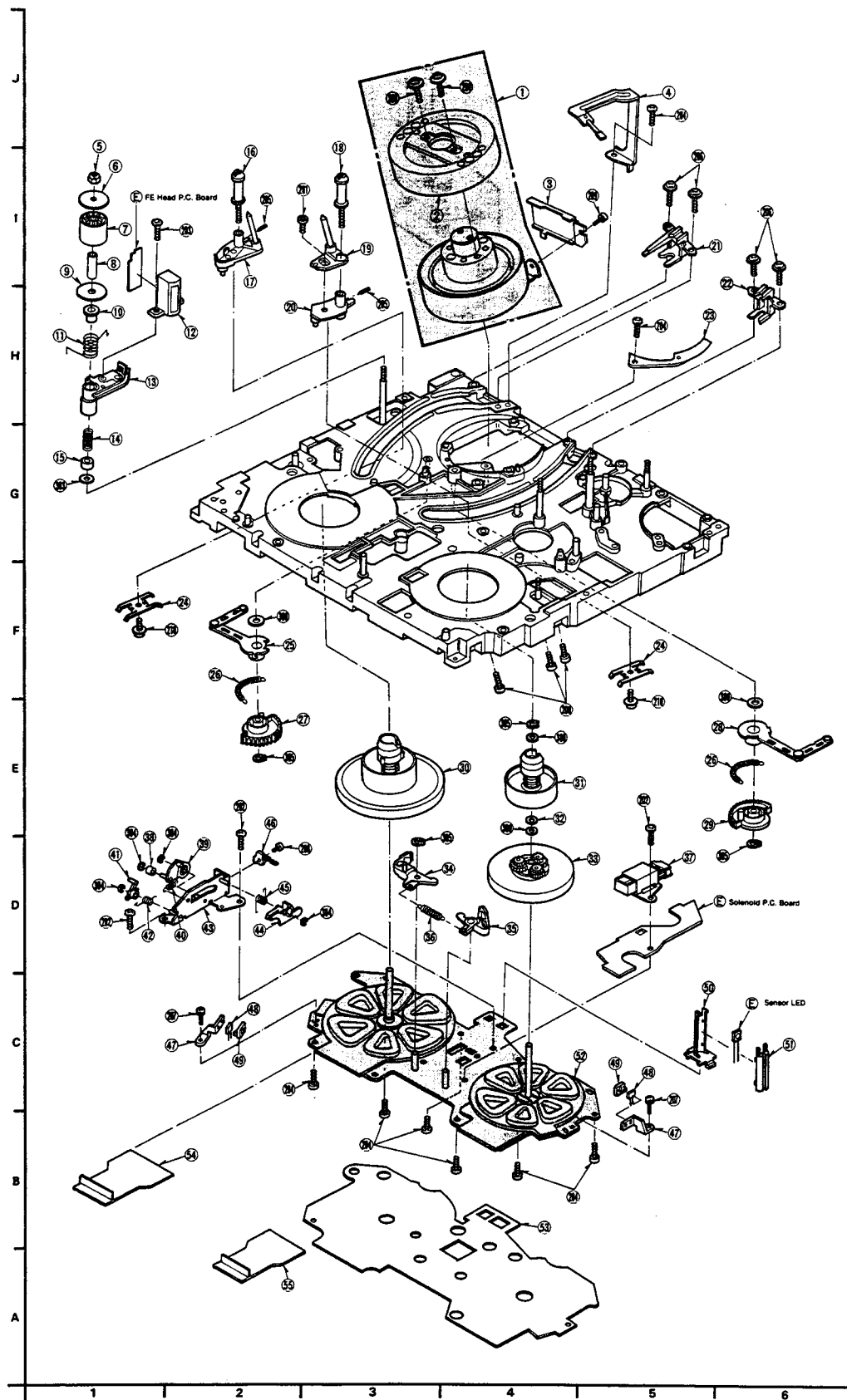


BOTTOM VIEW

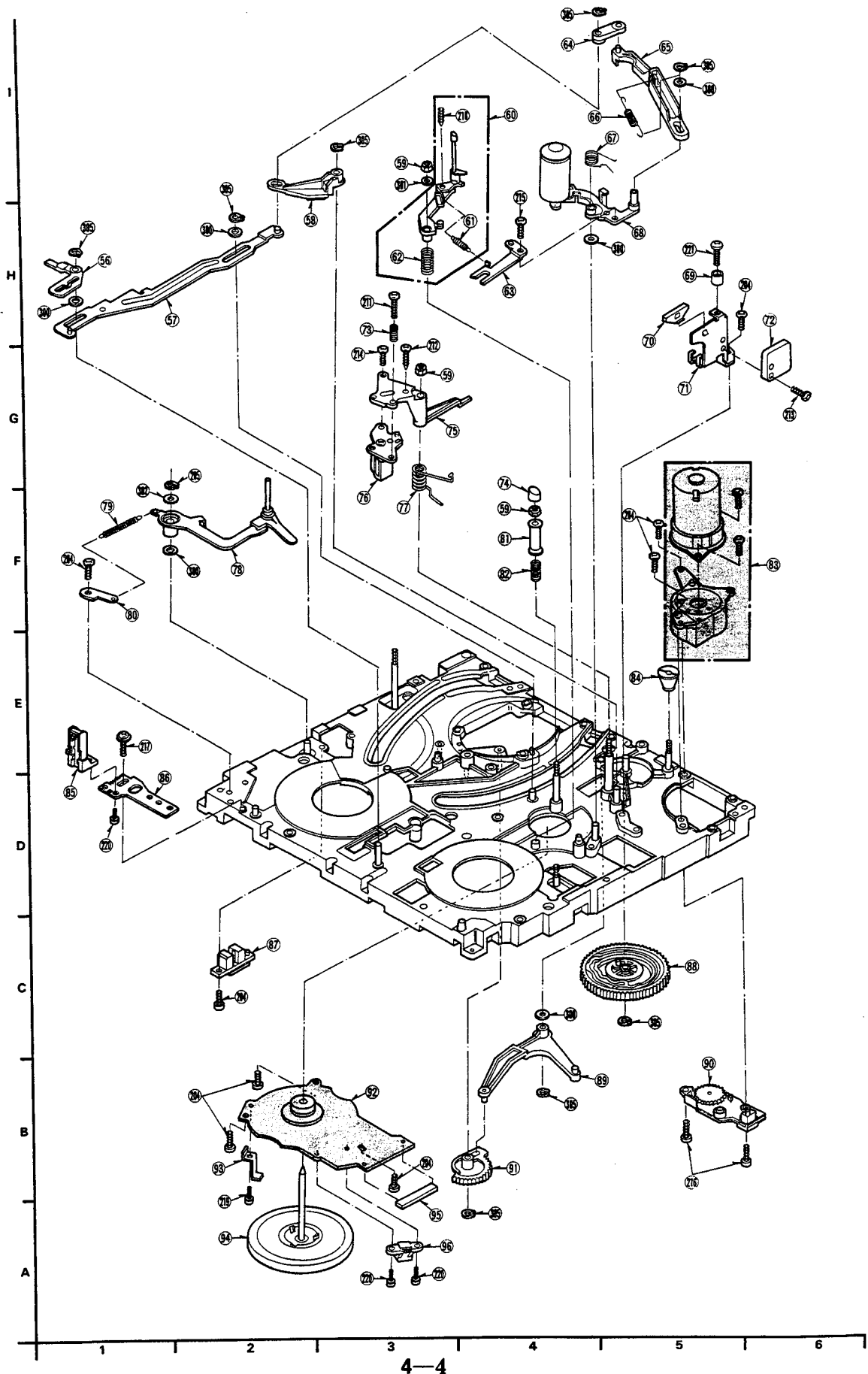


4-2. EXPLODED VIEW

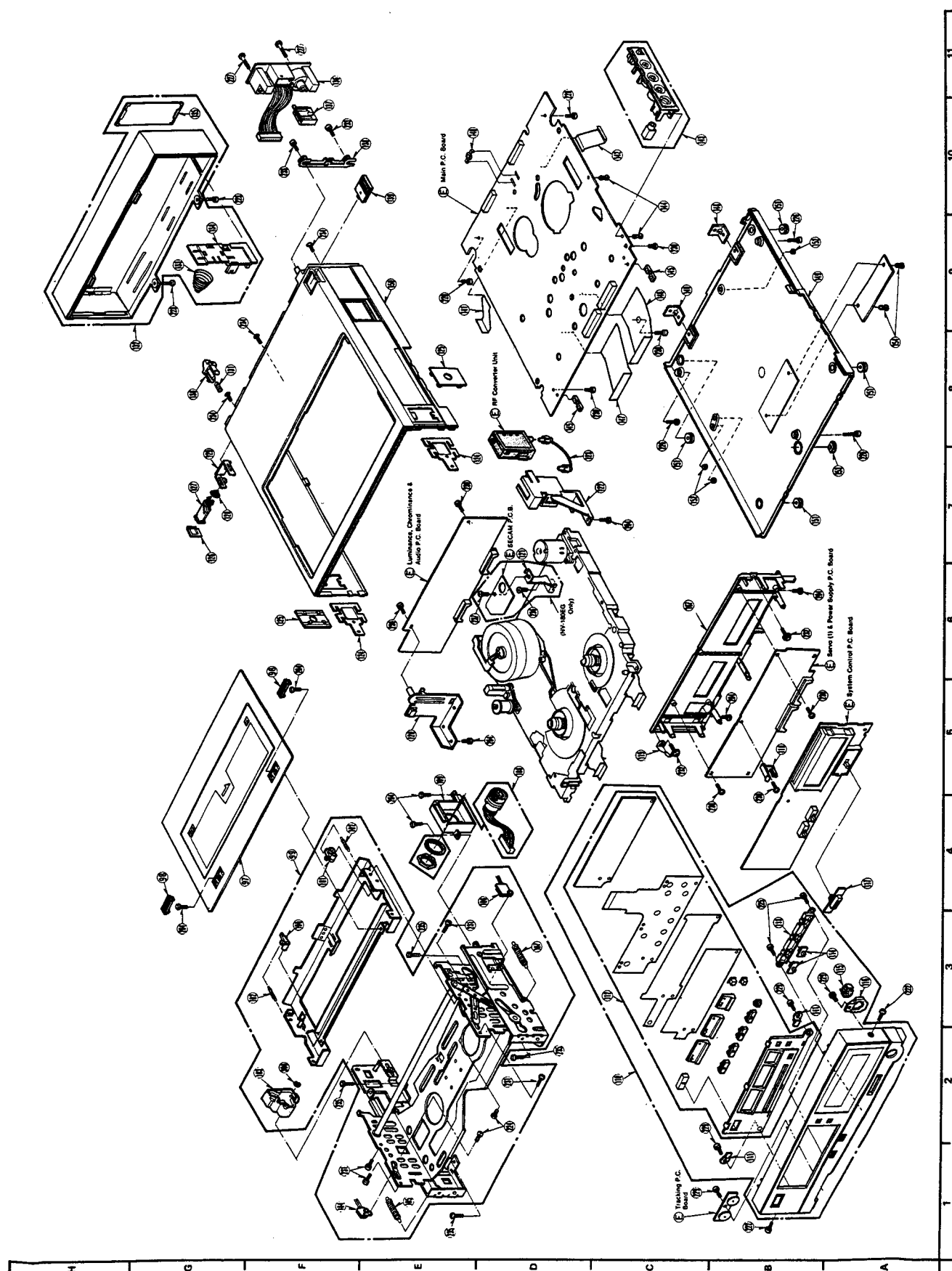
1 TRANSPORT SECTION



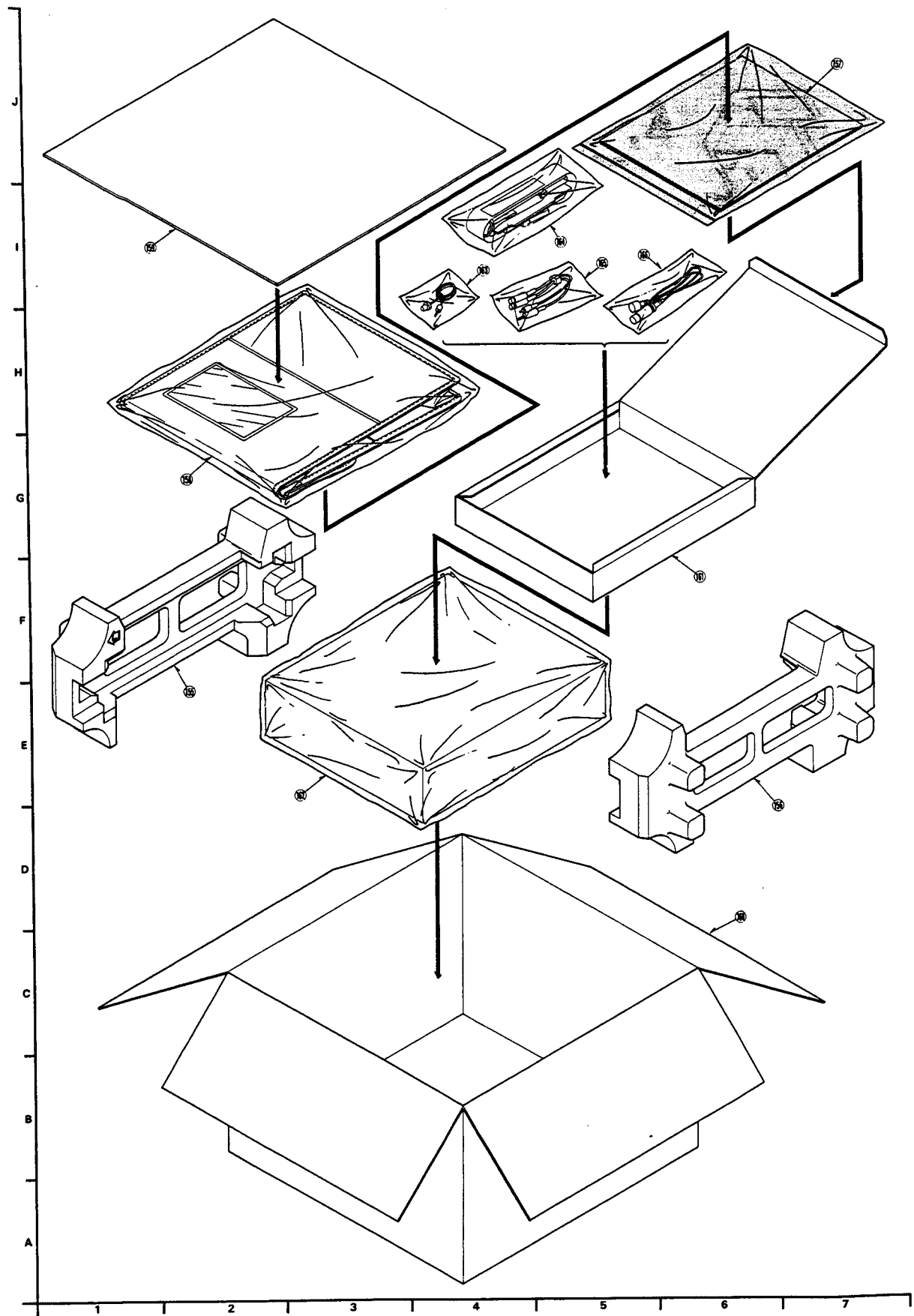
2 MOVING MECHANISM SECTION



3 CHASSIS PARTS, CASSETTE UP MECHANISM & CASING PARTS SECTION



④ PACKING PARTS SECTION



4.3. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)	VEG0336	Cylinder Unit	1	Δ
2(1)	VEH0252	Upper Cylinder Unit	1	
3(1)	VSG1142	Shield Board	1	
4(1)	VXS0060	Earth Plate Unit	1	
5(1)	VHN0023	Nut	1	
6(1)	VMX0692	Upper Limiter	1	
7(1)	VDP0970	Limiter Roller	1	
8(1)	VMX0288	Collar (B)	1	
9(1)	VMX0679	Lower Limiter	1	
10(1)	VDB0721	Limiter Stand	1	
11(1)	VMB1231	FE Head Lever Spring	1	
12(1)	VBS0031	FE Head	1	
13(1)	VML1569	FE Head Lever	1	
14(1)	VMB1239	Limiter Spring	1	
15(1)	VMX0680	Collar (A)	1	
16(1)	VXP0302A	Roller Post Unit (S)	1	
17(1)	VXA2039	Inclind Base (S) Unit	1	
18(1)	VXP0302C	Roller Post Unit (T)	1	
19(1)	VXA2041	Inclind Base (T) Unit	1	
20(1)	VXA2042	Shaft Holder (T) Unit	1	
21(1)	VMD0613	Post Stopper (S)	1	
22(1)	VMD0614	Post Stopper (T)	1	
23(1)	VMD0609	Inclind Support	1	
24(1)	VMA6422	Shaft Holder Plate	2	
25(1)	VXL1193	Loading Arm (S) Unit	1	
26(1)	VMB1232	Loading Spring	2	
27(1)	VXP0561	Loading Gear (S) Unit	1	
28(1)	VXL1191	Loading Arm (T) Unit	1	
29(1)	VXP0560	Loading Gear (T) Unit	1	
30(1)	VXR0122	Supply Reel Table Unit	1	
31(1)	VXR0121	Takeup Reel Table Unit	1	
32(1)	VMX0708D	Thrust Washer	1	
33(1)	VXP0564	Takeup Rotor Unit	1	
34(1)	VXZ0173	Main Brake (S) Unit	1	
35(1)	VXZ0174	Main Brake (T) Unit	1	
36(1)	VMB1241	Brake Spring	1	
37(1)	VJJ0066	Keep Solenoid	1	
38(1)	VDP0969	Lock Roller	1	
39(1)	VXA2035	Lock Board Unit	1	
40(1)	VMB1227	Lock Board Spring	1	
41(1)	VML1562	Lock Lever (B)	1	
42(1)	VMB1225	Lock Lever (S) Spring	1	
43(1)	VXA2034	Lock Plate Unit	1	
44(1)	VML1561	Lock Lever (A)	1	
45(1)	VMB1226	Lock Lever (A) Spring	1	
46(1)	VSH0019	Reef Switch	1	
47(1)	VMD0611	FG Support (1)	2	
48(1)	HW-300B	Hall IC	2	
49(1)	VMD0621	FG Support (2)	2	
50(1)	VMX0682	LED Holder (R)	1	
51(1)	VMX0683	LED Holder (L)	1	
52(1)	VXA2045	Stator Base Unit	1	Δ
53(1)	VMZ0565	Insulate Sheet	1	
54(1)	VMJ0158	Supply Reel Motor FPC	1	
55(1)	VMJ0159	Takeup Reel Motor FPC	1	
56(2)	VDK0009	Brake Cam	1	
57(2)	VXL1199	Main Rod Unit	1	
58(2)	VXL1198	Brake Arm Unit	1	
59(2)	VHN0023	Nut	3	
60(2)	VXL1196	P5 Arm Unit	1	
61(2)	VMB1237	Pin Pressure Spring	1	
62(2)	VMB1299	P5 Spring	1	
63(2)	VML1565	P5 Kick Lever	1	
64(2)	VML1563	Guide Lever	1	
65(2)	VMM0130	Pinch Rod	1	
66(2)	VMB1228	Pressure Spring	1	
67(2)	VMB1238	Pinch Arm Spring	1	
68(2)	VXL1229	Pressure Roller Unit	1	
69(2)	VDB0740	Stopper Boss	1	
70(2)	VMA6413	Opener Cover	1	
71(2)	VMA6421	Opener Angle	1	
72(2)	VEK2119	Dew Sensor Unit	1	
73(2)	VMB0935	Adjust Spring	1	
74(2)	VMD0619	P4 Post Cap	1	
75(2)	VML1567	A/C Head Arm	1	
76(2)	VEH0237	A/C Head	1	
77(2)	VMB1240	A/C Head Height Spring	1	
78(2)	VXL1200	Tension Arm Unit	1	
79(2)	VMB1230	Tension Arm Spring	1	
80(2)	VMD0604	Tension Arm Spring Tie (C)	1	
81(2)	VMX0681	Post Sleeve	1	
82(2)	VMB1239	Limiter Spring	1	
83(2)	VEM0207	Loading Motor Unit	1	Δ
84(2)	VHN0039	Adjust Nut	1	
85(2)	VSH0023	Safety Tab Switch	1	
86(2)	VMA6414	Safety Tab Base	1	
87(2)	VEK2116	Tension Sensor Unit	1	
88(2)	VXP0562	Cam Gear Unit	1	
89(2)	VXL1189	Lock Arm Unit	1	
90(2)	VSS0099	Mode Select SW	1	
91(2)	VDG0161	Lock Gear	1	
92(2)	VEK2113	Capstan Stator Unit	1	Δ
93(2)	VMA6470	Stopper	1	
94(2)	VXP0557	Capstan Rotor Unit	1	
95(2)	VJS1403	Capstan Stator Connector	1	
96(2)	VBK0041	MR. FG Sensor	1	
97(3)	VGP1002	Cassette Cover	1	NV-180E(Silver)
97(3)	VGP1051	Cassette Cover	1	NV-180E(Black)/EG/B
98(3)	VCK1212	Cassette Cover Cap	2	NV-180E(Silver)
98(3)	VCK1222	Cassette Cover Cap	2	NV-180E(Black)/EG/B
99(3)	VXA2037	Cassette Compartment Unit	1	
100(3)	VXL1225	Cassette Pressure Lever	1	
		(L)		
101(3)	VXL1226	Cassette Pressure Lever	1	
		(R)		
102(3)	VMB1222	Cassette Support Spring	2	
103(3)	VDG0169	Damper	1	
104(3)	VXA2121	Supply Photo Tr Unit	1	
105(3)	VMB1224	Holder Spring (L)	1	
106(3)	VXA2122	Takeup Photo Tr Unit	1	
107(3)	VMB1223	Holder Spring (R)	1	
108(3)	VEK2118	Camera Connector Unit	1	
109(3)	VJH0295	Camera Terminal	1	
110(3)	VYP0980	Front Panel Unit	1	NV-180E(Silver)
110(3)	VYP1065	Front Panel Unit	1	NV-180E(Black)/EG/B
111(3)	VMA6402	Key Board Support Angle	2	
112(3)	VXU0274	Key Board Unit	1	NV-180E(Silver)
112(3)	VXU0305	Key Board Unit	1	NV-180E(Black)/EG/B
113(3)	VQG0664	Mode Select Knob Angle	1	
114(3)	VGU1170	Mode Select Knob	2	NV-180E(Silver)
114(3)	VGU1571	Mode Select Knob	2	NV-180E(Black)/EG/B
115(3)	VEK2123	Remote Control Jack Unit	1	
116(3)	VQG0608	Remote Control Jack Mount	1	
		Angle		
117(3)	VGU1292	Power Switch Button Unit	1	
118(3)	VJF0188	P. C. Board Support Piece	1	
119(3)	VMC0055	Earth Spring (A)	1	
120(3)	VMD0600	Back Frame (L)	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
121(3)	VMA6489	SECAM P. C. Board Angle	1	NV-180EG	208(1)	XYN2+E6		1	
122(3)	VMD0599	Back Frame (R)	1		209(1)	XYN2+F5		1	
123(3)	VEE0991	RF Converter Cable Unit	1		210(1)	XYN26+F5		1	
124(3)	VMA6401	Belt Support Angle	2		211(2)	VHD0077		1	
125(3)	VGK1211	Belt Holder	2		212(2)	VHD0144		1	
126(3)	VGU1348	Battery Eject Button (A)	1		213(2)	XSN26+8		1	
127(3)	VGQ0614	Battery Eject Button (B)	1		214(2)	XSN26+8FZ		1	
128(3)	VMB1220	Battery Eject Spring	1		215(2)	XSN26+4		1	
129(3)	VMA6400	Eject Button Angle	1		216(2)	XTV26+8F		2	
130(3)	VGQ0609	Battery Stopper	1		217(2)	XYE26+BF6FZ		1	
131(3)	VMB1221	Battery Stopper Spring	1		218(2)	XYE2C3FP		1	
132(3)	VYK0690	Battery Case Unit	1	NV-180E(Silver)	219(2)	XYN26+C4		1	
132(3)	VYK0763	Battery Case Unit	1	NV-180E (Black) /EG/B	220(2)	XYN26+C5		3	
133(3)	VMB1219	Battery Spring	1		221(2)	XTN26+10F		1	
134(3)	VJF0189	Battery Catcher	1		222(3)	XTB26+4FFC		2	NV-180E (Silver)
135(3)	VYF0443	Multi Door Unit	1		222(3)	XTB26+4FFZ		2	NV-180E (Black) /EG/B
136(3)	VEK2195	Multi Connector Unit	1		223(3)	XTB26+4FFZ		2	
137(3)	VEK2192	Multi Switch Unit	1		224(3)	XTN2+6G		2	
138(3)	VMP0450	Multi Jack Angle	1		225(3)	XTS23+6J		2	
139(3)	VKF0332	RF Converter Cover	1	NV-180E (Silver)	226(3)	XTV26+10FFZ		4	
139(3)	VKF0426	RF Converter Cover	1	NV-180E (Black) /EG/B	227(3)	XTV26+12FFZ		2	
140(3)	VMK0699	Spacer	1		228(3)	XTV26+6FR		2	
141(3)	VWJ0157	Main Board FPC (A)	1		229(3)	XTV26+6J		4	
142(3)	VWJ0155	Main Board FPC (B)	1		230(3)	XTV26+6JR		8	
143(3)	VEJ0330	Jack Board Unit	1		231(3)	XYN26+C6		4	
144(3)	VHN0011	Rivet	2		232(3)	XYN26+F6		2	
145(3)	VKC0124	Hinge	2		233(3)	XTV26+6S		2	
146(3)	VWJ0161	Main Board FPC (C)	1		234(3)	XSS26+5		3	
147(3)	VWJ0160	Main Board FPC (D)	1		235(3)	XYE26+BF8		4	
148(3)	VMA6399	Bottom Case Angle	2		236(3)	XTV26+6F		1	NV-180EG
149(3)	VKM0347	Bottom Case	1		237(3)	XTV26+6FR		1	NV-180EG
150(3)	VKM0267	Top Case	1	NV-180E (Silver)					
150(3)	VKM0346	Top Case	1	NV-180E (Black) /EG/B					
151(3)	VKA0038	Foot Rubber	4				Washers & Rings		
152(3)	VMG0312	Rubber Cap (A)	3		300(1,2)	XWGV3D6G		11	
153(3)	VMG0318	Rubber Cap (B)	1		301(2)	XWGV3D5G		1	
154(3)	VHN0030	Rivet	2		302(2)	XWGV3D7G		1	
155(4)	VPM0984	Cushion (L)	1		303(1)	XUC15FP		4	
156(4)	VPM0983	Cushion (R)	1		304(1,2)	XUEV3VW		13	
157(4)	VQF1203	Fan Bag Kit	1	NV-180E A	305(3)	XUC25FP		1	
157(4)	VQF1204	Fan Bag Kit	1	NV-180EG A					
157(4)	VQF1205	Fan Bag Kit	1	NV-180B A					
158(4)	VFC0032	Carrying Case	1	NV-180E (Silver)					
158(4)	VFC0036	Carrying Case	1	NV-180E (Black) /EG/B					
159(4)	VPM1095	Upper Cushion	1						
160(4)	VPG1663	Packing Case	1	NV-180E (Silver)					
160(4)	VPG1769	Packing Case	1	NV-180E (Black)					
160(4)	VPG1664	Packing Case	1	NV-180EG					
160(4)	VPG1665	Packing Case	1	NV-180B					
161(4)	VPK0360	Accessory Case	1						
162(4)	VPF0210	Polyethylene Bag	1						
163(4)	VBE0003	Earphone	1						
164(4)	VFB0053	Shoulder Belt	1						
165(4)	VJP1431	Audio Cable	1						
166(4)	VJA0130	DIN-RF Cable	2						
167(3)	VMD0598	Front Frame	1						
		Screws							
200(1)	VHD0081		5						
201(1)	VHD0162		1						
202(1,2)	XSN26+4		3						
203(1)	XTN26+6G		1						
204(1,2,3)	XTV26+6F		24						
205(1)	XXEV0004		2						
206(1)	XYE26+BF8FZ		4						
207(1)	XYN2+C4		2						

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Resistors							
R2501	ERDS2TJ120	12	1		C2533-2535	ECEA1VSN2R2	Electrolytic 35V 2.2	3	
R2502	ERDS2TJ102	1K	1		C2536	ECEA1AKS470	Electrolytic 10V 47	1	
R2503	ERDS2TJR56	0.56	1		C2537	ECEA1CKK100	Electrolytic 16V 10	1	
R2505	ERDS2TJR56	0.56	1		C2538-2543	VCYE1C473MR	Semiconductor 16V 0.047	6	
R2506	ERDS2TJ333	33K	1		C2545	ECEA1CKS470	Electrolytic 16V 47	1	
R2507	ERDS2TJ124	120K	1		C2546	VCYE1C103MR	Semiconductor 16V 0.01	1	
R2508	ERDS2TJ104	100K	1		C2547	ECKFIH472ZF	Ceramic 50V 4700P	1	
R2509	ERDS2TJ6R8	6.8	1				Coil		
R2510	ERDS2TJ332	3.3K	1		L2501	VLQEL05F221K	220uH	1	
R2511	ERDS2TJ101	100	1						
R2512	ERDS2TJ332	3.3K	1				Switch		
R2513	ERDS2TJ103	10K	1		SW2501	ESD14126		1	
R2514	ERDS2TJ682	6.8K	1						
R2515	ERDS2TJ334	330K	1						
R2516	ERDS2TJ223	22K	1						
R2517	ERDS2TJ333	33K	1						
R2518	ERDS2TJ563	56K	1						
R2519	ERDS2TJ683	68K	1						
R2520	ERDS2TJ223	22K	1				Combination Parts (Capacitor & Resistor)		
R2521	ERDS2TJ123	12K	1		CR2501	EXED103Z183C	0.01 18K	1	
R2522	ERDS2TJ221	220	1						
R2524	ERDS2TJ561	560	1						
R2525	ERDS2TJR56	0.56	1						
R2526	ERDS2TJ120	12	1						
R2527, 2528	ERDS2TJ224	220K	2						
R2529	ERDS2TJ104	100K	1						
R2530	ERDS2TJ223	22K	1						
R2531	ERDS2TJ103	10K	1				(Picture VR Section)		
R2532	ERDS2TJR68	0.68	1				Resistor		
R2533	ERDS2TJ332	3.3K	1		R3501	ERDS2TJ682	6.8K	1	
R2534	ERDS2TJ223	22K	1						
R2535	ERDS2TJ224	220K	1						
R2536	ERDS2TJ221	220	1				Variable Resistor		
R2537	ERDS2TJ820	82	1		VR3504	EVN3ACA00B24	20K	1	
R2540	ERDS2TJ820	82	1						
R2542	ERDS2TJ153	15K	1						
R2543	ERDS2TJ563	56K	1						
R2544, 2545	ERDS2TJ688	6.8	2						
R2546	ERDS2TJ563	56K	1						
							(Jack Section)		
							Integrated Circuit		
		Capacitors			IC6501	VCR0095		1	
C2501, 2502	ECEA1EKK010	Electrolytic 25V	1 2		IC6502	VCR0092		1	
C2503-2505	ECEA1EKK4R7	Electrolytic 25V	4.7 3						
C2506	ECEA1CKS470	Electrolytic 16V	47 1						
C2507, 2508	VCYE1C103MR	Semiconductor 16V	0.01 2						
C2509-2511	ECEA1VSN2R2	Electrolytic 35V	2.2 3						
C2512	ECEA1EKK3R3	Electrolytic 25V	3.3 1				Diodes		
C2513	ECQB1H682KH	Mylar 50V 6800P	1		D6501	ERC81004		1	
C2514	ECQB1H123KZ	Mylar 50V 0.012	1		D6502, 6503	MA165		2	
C2515	ECEA1EKKR22	Electrolytic 25V	0.22 1						
C2516	ECEA0GKS470	Electrolytic 4V	47 1						
C2517	ECEA1EKK010	Electrolytic 25V	1 1						
C2518	ECKFIH101KB	Ceramic 50V 100P	1				Resistors		
C2520	ECQVIH473JZ	Mylar 50V 0.047	1		R6501	ERDS2TJ750	75	1	
C2521	ECEA0JKS470	Electrolytic 6.3V	47 1		R6503	ERDS2TJ681	680	1	
C2522	ECEA1EKKR22	Electrolytic 25V	0.22 1		R6504	ERDS2TJ750	75	1	
C2523	ECEA1EKK4R7	Electrolytic 25V	4.7 1		R6505	ERDS2TJ681	680	1	
C2524	ECEA1EKKR22	Electrolytic 25V	0.22 1		R6506	ERDS2TJ472	4.7K	1	
C2525	ECEA1EKK4R7	Electrolytic 25V	4.7 1		R6507	ERDS2TJ104	100K	1	
C2526, 2527	ECEA1EKK010	Electrolytic 25V	1 2		R6508	ERDS2TJ331	330	1	
C2528-2530	ECEA1EKK4R7	Electrolytic 25V	4.7 3		R6509	ERDS2TJ472	4.7K	1	
C2531	VCYE1C104MR	Semiconductor 16V	0.1 1		R6510	ERDS2TJ750	75	1	
C2532	ECEA1EKK010	Electrolytic 25V	1 1		R6511	ERDS2TJ392	3.9K	1	

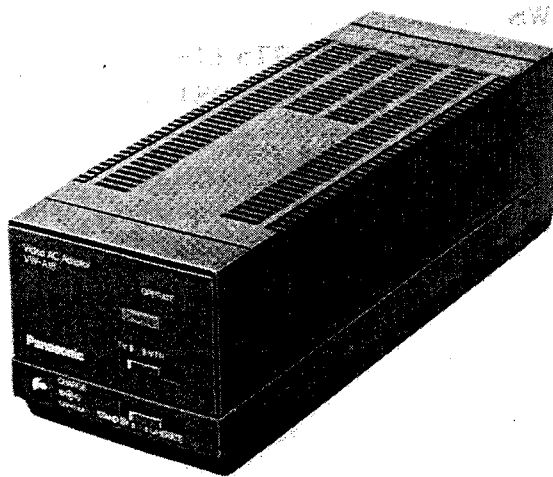
Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Capacitors		
C3001	ECEAJK221	Electrolytic 6.3V 220	1	
C3002	VCEI1C473MR	Semiconductor 16V 0.047	1	
C3003	ECKF1H221KB	Ceramic 50V 220P	1	
C3004	ECEAJK221	Electrolytic 6.3V 220	1	
C3005	VCEI1C473MR	Semiconductor 16V 0.047	1	
C3006	ECEAIKK3R3	Electrolytic 25V 3.3	1	
C3007	ECEAIKK4R7	Electrolytic 25V 4.7	1	
C3008	ECEAIKK2R2	Electrolytic 25V 2.2	1	
C3009	ECEAIKK3R3	Electrolytic 25V 3.3	1	
C3010	ECEAJKS220	Electrolytic 6.3V 22	1	
C3011	ECCF1H680K	Ceramic 50V 68P	1	
C3012	ECCF1H220K	Ceramic 50V 22P	1	
C3013	ECKF1H271J	Ceramic 50V 270P	1	
C3014	ECEAIKK3R3	Electrolytic 25V 3.3	1	
C3015	ECEAJKS220	Electrolytic 6.3V 22	1	
C3016,3017	ECEAJK221	Electrolytic 6.3V 220	2	
C3018,3019	ECEAIJS330	Electrolytic 10V 33	2	
C3020	ECEAIKS220	Electrolytic 10V 22	1	
C3021	ECKF1H102KB	Ceramic 50V 1000P	1	
C3023	ECCF1H680K	Ceramic 50V 68P	1	
C3024	ECSF1CD105	Tantalum 16V 1	1	
C3025	ECEAIKS330	Electrolytic 10V 33	1	
C3026	ECKF1H181KB	Ceramic 50V 180P	1	
C3027	ECEAICK100	Electrolytic 16V 10	1	
C3028	ECKF1H121KB	Ceramic 50V 120P	1	
C3030	ECEAICK100	Electrolytic 16V 10	1	
C3031,3032	ECV1ZW90X64	Trimmer 500V 90P	2	
C3033,3034	ECEAICK100	Electrolytic 16V 10	2	
C3035,3036	ECV1ZW90X64	Trimmer 500V 90P	2	
C3037	ECEAICK100	Electrolytic 16V 10	1	
C3038-3043	VCEI1C103MR	Semiconductor 16V 0.01	6	
C3044	ECEAJKS470	Electrolytic 6.3V 47	1	
C3045	VCEI1C473MR	Semiconductor 16V 0.047	1	
C3046	ECKF1H151KB	Ceramic 50V 150P	1	
C3047	ECCF1H820J	Ceramic 50V 82P	1	
C3048	VCKF1H431J	Semiconductor 50V 430P	1	
C3049	ECSF1CD105	Tantalum 16V 1	1	
C3050	ECCF1H220K	Ceramic 50V 22P	1	
C3051	ECKF1H102KB	Ceramic 50V 1000P	1	
C3053	ECEAICK100	Electrolytic 16V 10	1	
C3054	ECCF1H050K	Ceramic 50V 5P	1	
		Coils		
L3001	VLQEL05F101K	100µH	1	
L3002	VLQEL05F471K	470µH	1	
L3003	VLQEL05F101K	100µH	1	
L3004	VLQEL05F471K	470µH	1	
L3005	VLQEL05F101K	100µH	1	
L3006	VLQEL05F820K	82µH	1	
L3007	VLQEL05F471K	470µH	1	
L3008	VLQEL05F270K	27µH	1	
L3009	VLQEL05F151K	150µH	1	
L3010	VLQEL05F180K	18µH	1	
L3011	VLQEL05F150K	15µH	1	
L3012	VLQEL05F151K	150µH	1	
L3013	VLQEL05F220K	22µH	1	
L3014,3015	VLQEL05F150K	15µH	2	

Ref. No.	Part No.	Part Name & Description	Pos / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pos / Set	Remarks
D6014	10E1		1						
D6015	MA165		1						
D6016	10E1		1						
D6017,6018	MA165		2				Variable Resistor		
D6019,6020	MA154WA		2		VR6001	EVML3GA00B14	1K	1	
D6021	MA165		1						
D6023	MA165		1						
		Resistors					Capacitors		
R6001,6002	ERDS2TJ473	47K	2		C6001	ECEA0JKS101	Electrolytic 6.3V 100	1	
R6003	ERDS2TJ270	27	1		C6002	ECKF1H103ZF	Ceramic 50V 0.01	1	
R6004,6005	ERDS2TJ104	100K	2		C6003	ECCF1H330KC	Ceramic 50V 33P	1	
R6006	ERDS2TJ472	4.7K	1		C6004	ECFC1H100DC	Ceramic 50V 10P	1	
R6007	ERDS2TJ103	10K	1		C6005	ECEA1H010	Electrolytic 50V	1	1
R6008	ERDS2TJ562	5.6K	1		C6006,6007	ECKF1H103ZF	Ceramic 50V 0.01	2	
R6009	ERGLANJ820	Metal Oxide 1W	82	1	C6008	ECEA1VSN2R2	Electrolytic 35V 2.2	1	
R6010	ERDS2TJ104	100K	1		C6009-6012	ECEA1HKS010	Electrolytic 50V	1	4
R6011	ERDS2TJ184	180K	1		C6013-6015	ECKF1H103ZF	Ceramic 50V 0.01	3	
R6012	ERDS2TJ124	120K	1		C6016	ECEA1CU471	Electrolytic 16V 470	1	
R6013	ERDS2TJ221	220	1		C6017	ECEA0GKS470	Electrolytic 4V	47	1
R6014	ERDS2TJ102	1K	1		C6018,6019	ECKF1H103ZF	Ceramic 50V 0.01	2	
R6015	ERDS2TJ103	10K	1		C6020	ECEA1EKS4R7	Electrolytic 25V 4.7	1	
R6016	ERDS2TJ683	68K	1		C6021	ECEA0JKS220	Electrolytic 6.3V 22	1	
R6017	ERDS2TJ104	100K	1		C6022	VCYE1C103MR	Semiconductor 16V 0.01	1	
R6018	ERDS2TJ472	4.7K	1		C6023	ECQB1H183KH	Mylar 50V 0.018	1	
R6019	ERDS2TJ224	220K	1		C6024-6026	VCYE1C103MR	Semiconductor 16V 0.01	3	
R6020	ERDS2TJ474	470K	1		C6027	ECEA1HKS010	Electrolytic 50V	1	1
R6021	ERDS2TJ222	2.2K	1						
R6022	ERDS2TJ103	10K	1						
R6023	ERDS2TJ823	8.2K	1				Crystal Oscillator		
R6024	ERDS2TJ681	680	1		X6001	VSX0086		1	
R6025	ERDS2TJ563	56K	1						
R6027	ERDS2TJ273	27K	1						
R6028	ERDS2TJ104	100K	1						
R6029,6030	ERDS2TJ153	15K	2				Switches		
R6031	ERDS2TJ221	220	1		SW601	EMR2521		1	△
R6032	ERDS2TJ332	3.3K	1		SW602	VSS0101		1	
R6033,6034	ERDS2TJ271	270	1		SW604	VSS0101		1	
R6035	ERDS2TJ103	10K	1						
R6036	ERDS2TJ223	22K	1						
R6037	ERDS2TJ103	10K	1						
R6038,6039	ERDS2TJ563	56K	2				Connectors		
R6040,6041	ERDS2TJ104	100K	2		P601	VJP1244	4P	1	
R6042	ERDS2TJ562	5.6K	1		P602	VJP1242	2P	1	
R6043,6044	ERDS2TJ103	10K	2						
R6045,6046	ERDS2TJ104	100K	2						
R6048	ERDS2TJ223	22K	1						
R6049	ERDS2TJ271	270	1				Miscellaneous		
R6050	ERDS2TJ184	180K	1		PR1	VSF0015A08	IC Protector	1	△
R6051	ERDS2TJ474	470K	1			VHN0040	Rivet	2	
R6052	ERDS2TJ223	22K	1			VJF0190	Fuse Holder	2	△
R6053-6055	ERDS2TJ104	100K	3			EDD073K22A3	LED	1	
R6056	ERDS2TJ184	180K	1			LNO408CP3	Back Light	1	
R6057,6058	ERDS2TJ103	10K	2			VMD0601	Display Case	1	
R6059	ERDS2TJ222	2.2K	1			VMD0602	Display Case (Bottom)	1	
R6060	ERDS2TJ473	47K	1			VSQ0344	Zebra Rubber	1	
R6061	ERDS2TJ104	100K	1			XTNV14+5Z	Screw	6	
R6063,6064	ERDS2TJ101	100	2			XTNV14+8Z	Screw	1	
R6065	ERDS2TJ223	22K	1						
R6066	ERDS2TJ472	4.7K	1						
R6067	ERDS2TJ473	47K	1						
R6068	ERDS2TJ102	1K	1						
R6069	ERDS2TJ223	22K	1						
R6070	ERDS2TJ123	12K	1						
R6071-6073	ERDS2TJ223	22K	3						

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	ENC17751/	RF Converter Unit			C1503	ECQV1H333JZ	Mylar 50V 0.033	1	
	ENC17752				C1504	VCFY1C103MR	Semiconductor 16V 0.01	1	
		Integrated Circuit					Coil		
IC1	AN3130		1		L1501	VLQEL05F221K	220uH	1	
		Transistor					Transformer		
Q1	ZSC2480		1		T1501	VID0014		1	
		Diodes					Connector		
D1,2	1SS86		2	or 1SS174	P654	VJP1229	2P	1	
		Resistors							
R1	ERJ6GCSJ391	Chip	390	1					
R2	ERJ6GCSJ681	Chip	680	1					
R3	EVN3ACA00B14	Variable	10K	1					
R4	ERJ6GCSJ823	Chip	82K	1					
R5	ERDS2TJ562		5.6K	1					
R6	ERJ6GCSJ331	Chip	330	1					
R7	ERJ6GCSJ122	Chip	1.2K	1		VJB00B68	Tracking P.C. Board		
R8	ERJ6GCSJ221	Chip	220	1					
R9	ERJ6GCSJ560	Chip	56	1					
R10	ERJ6GCSJ680	Chip	68	1			Resistors		
					R6561,6562	EVLB6AA00B15	Variable 100K	2	
		Connector							
F1	VJB1143		5P	1		VJB00B87	Tension Sensor P.C. Board		
	NOTE:				Q1504	ON1301	Photo Caprier	1	(Q) R1502 is
	The Capacitors, Filters, Transformers								ERDS2TJ102
	for the RF Converter Unit are not								or (R) ... R1502 is
	available as spare parts.								ERDS2TJ182
							Resistor		
					R1502	ERDS2TJ102	1K	1	In case Q1504 is
									ON1301 (Q)
					R1502	ERDS2TJ182	1.8K	1	In case Q1504 is
									ON1301 (R)
	VJB00B67	FE Head P.C. Board	1						
		Transistor							
Q1503	ZSC2603A		1						
		Resistor							
R1501	ERDS2TJ333		33K	1					
		Capacitors							
C1501	ECKF1H472ZF	Ceramic 50V 4700P	1						
C1502	ECEA1CKS100	Electrolytic 16V 10	1						

AC Adaptor

VW-A18^E_B



SPECIFICATIONS

Power Source:	220/240 V AC 50/60 Hz
Power Consumption:	40 W
Output:	12 V DC, 1.2 A
	12 V DC, 1.4 A for battery charge
	20 V DC, 0.15 A for HEATER (VTR MODE)
Weight:	2.6 kg
Dimensions:	87(W) × 69(H) × 238(D) mm

Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

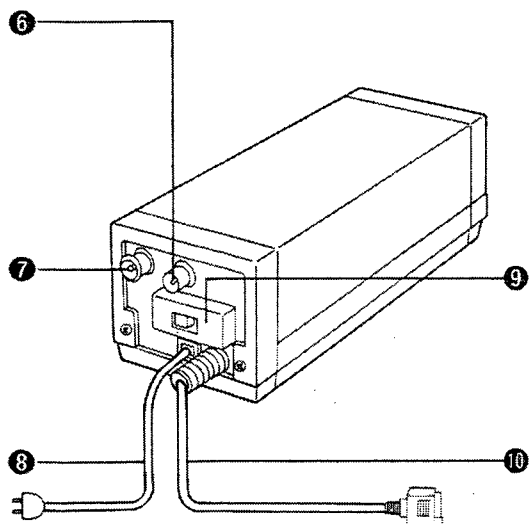
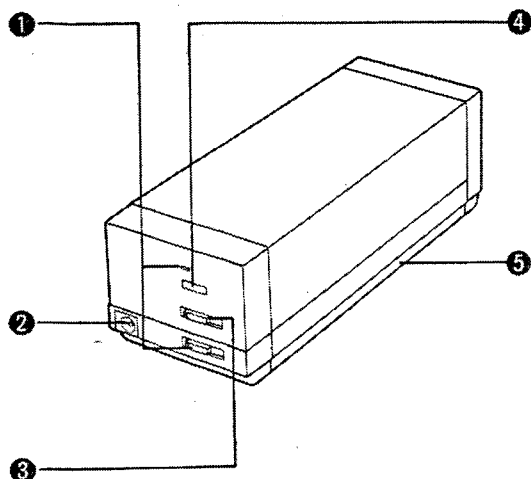
CAUTION: FOR USE WITH VIDEO TAPE RECORDER, MODEL NV-180.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

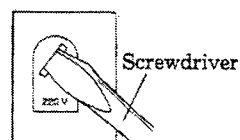
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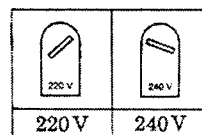
1. CONTROLS AND COMPONENTS



- ❶ **Operation Switch with indicator lamp**
Set to "OPERATE" to turn the unit on.
- ❷ **Battery Pack Charging Socket**
Used for charging the battery pack.
- ❸ **TV/VTR Selector Switch**
VTR: Used to play back a video cassette.
TV: Used to watch TV.
- ❹ **Charging Indicator Lamp**
Lights up when the battery pack is charged. When charging is completed, this lamp goes off.
- ❺ **Voltage Selector**
Ensure that the selector is set at the same indication as the local mains voltage before plugging.



Voltage Selector



Note:

Power Switch must be off and Power Cord disconnected from mains prior to changing the voltage selector.

- ❻ **RF Output Socket**
Connect it to TV.
- ❼ **RF Input Socket**
Connect it to an antenna.
- ❽ **Mains Cord**
For connection to an ordinary mains.
- ❾ **POWER ON/OFF Switch**
Switching on applies power to the unit. To switch off this unit completely, set to "OFF".
- ❿ **Adaptor Cable**
Connect to the VTR's adaptor socket.

2. DISASSEMBLY METHOD

1. Removal of the Top Case

Unscrew the 2 screws (A) and remove the Top Case.

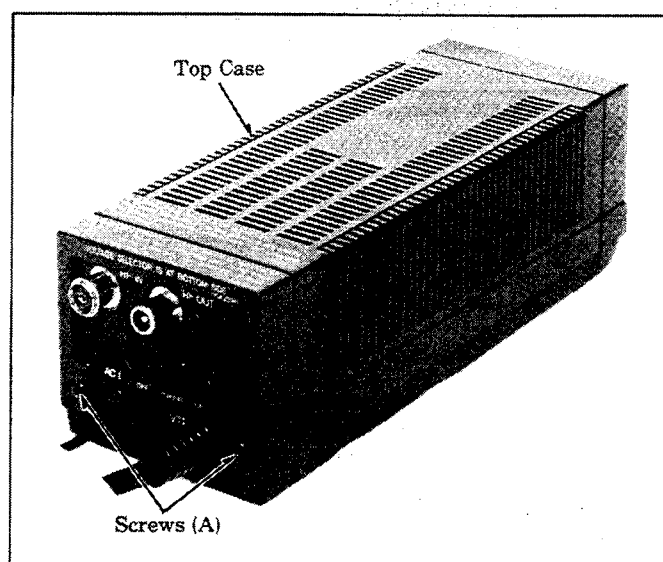


Fig. 1 Removal of the Top Case

2. Removal of the Front Panel

Unscrew the 2 screws (B) and remove the Front Panel.

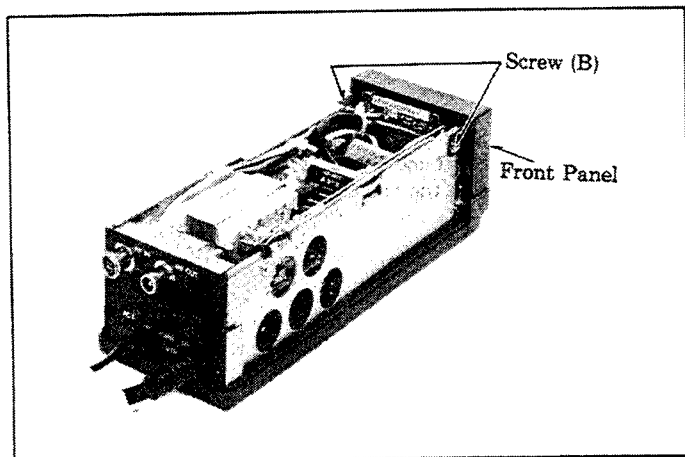


Fig. 2 Removal of the Front Panel

3. Removal of the Bottom Case

Unscrew the 4 screws (C) and remove the Bottom Case.

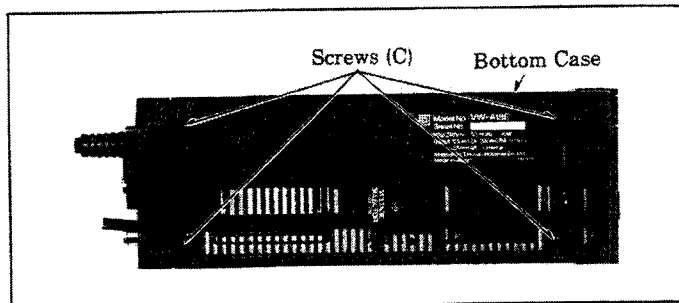


Fig. 3 Removal of the Bottom Case

4. Removal of the Main C. Board

Unscrew 3 screws (D) and remove the cord clumper (E), then lift the Main P.C. Board.

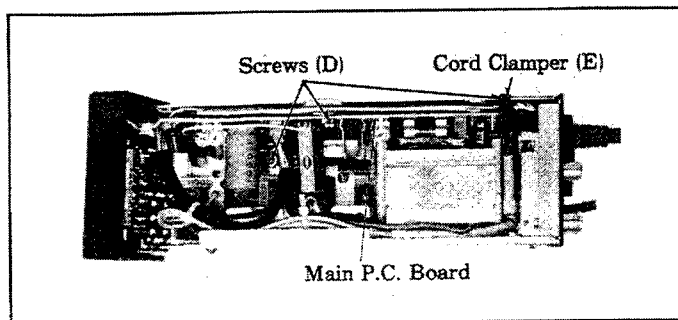


Fig. 4 Removal of the Main C. Board

5. Removal of the Primary C. Board

Unscrew the screw (F) and lift the Primary C. Board.

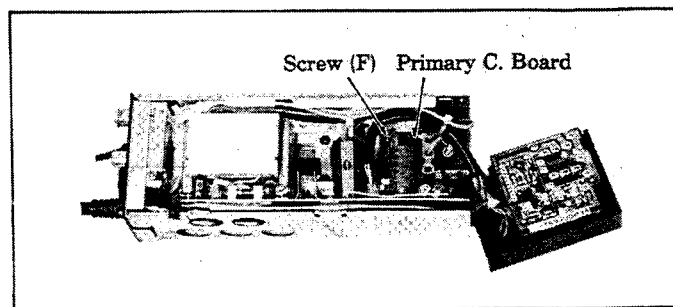


Fig. 5 Removal of the Primary C. Board

6. Removal of the Front C. Board

Unscrew the 2 screws (G) and Unlock the 2 locking tabs (H) to remove the Front C. Board.

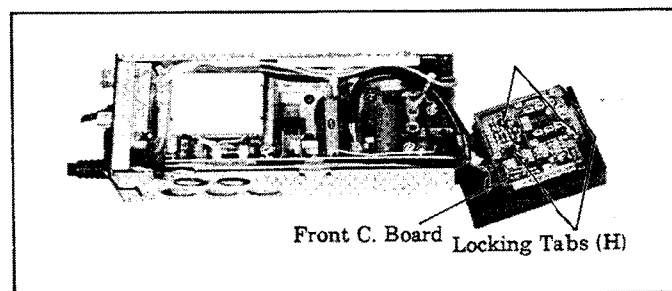


Fig. 6 Removal of the Front C. Board

7. Removal of the LED C. Board

Unlock the 2 locking tabs (I) to remove the LED C. Board.

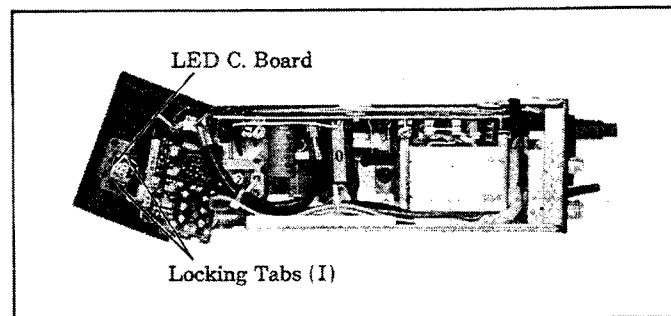


Fig. 7 Removal of the LED C. Board

9. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. • Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)	VKM0270	Top Case	1	VW-A18E (Silver)
1(1)	VKM0351	Top Case	1	VW-A18E (Black)/B
2(1)	VYP0991	Front Panel Unit	1	VW-A18E (Silver)
2(1)	VYP1069	Front Panel Unit	1	VW-A18E (Black)/B
3(1)	VJS1036	External Socket	1	
4(1)	VMK0238	Chassis	1	
5(1)	VMP0418	Reinforcement Angle	1	
6(1)	VKM0316	Bottom Case	1	
7(1)	VHN0011	Nylon Latch	2	
8(1)	VGU1192	Antenna Switch Knob	1	
9(1)	VGU1191	Power Switch Knob	1	
10(1)	VGH0236	Rear Name Plate	1	
11(1)	VJH0308	Rear Frame	1	
12(1)	VEC0365	Multi Connector Unit	1	
13(1)	VJA0111	AC Cord	1	VW-A18E Δ
13(1)	VJA0112	AC Cord	1	VW-A18B Δ
14(1)	VMA6416	Voltage Selector Angle	1	
15(1)	VMP0484	All Off Switch Angle	1	
16(1)	VJF0017	AC Cord Bushing	1	Δ
17(1)	VMX0399	Voltage Selector Cover	1	Δ
18(1)	VMZ0580	All Off Switch Cover	1	Δ
21(2)	VJA0180	Battery Catcher	1	
22(2)	VQF1213	Fan Bag Kit	1	VW-A18E Δ
22(2)	VQF1260	Fan Bag Kit	1	VW-A18B Δ
23(2)	VPF0201	Polyethylene Bag	1	
24(2)	VPF0202	Polyethylene Bag (Cord)	1	
25(2)	VPG1674	Packing Case	1	VW-A18E (Silver)
25(2)	VPG1791	Packing Case	1	VW-A18E (Black)
25(2)	VPG1772	Packing Case	1	VW-A18B
26(2)	VFN0988	Cushion	2	
31(1)	XTV3+6J	Screws	2	
32(1)	XSS3+6FS		2	
33(1)	XTV3+6FS		6	
34(1)	XYN3+6FS		1	
35(1)	XSB3+6FZS		10	
36(1)	XYN3+B6FS		2	
37(1)	XTT4+5FS		2	
38(1)	XTN3+5FS		2	

10. ELECTRICAL REPLACEMENT PARTS LIST

Notes: 1. • Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified.
All resistors are in OHMS (Ω), 1/4W $\pm 5\%$ carbon. K=1,000 Ω , M=1,000 K Ω . All capacitors are in MICROFARADS (μ F), $\pm 10\%$ P= μ F.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP00C12B	Main P.C. Board Unit	1	
	VEP00C69A	Front P.C. Board Unit	1	
	VEP00C71A	Antenna P.C. Board Unit	1	Δ
	VJB00C25	LED P.C. Board	1	
	VJB00C70	Primary P.C. Board	1	Δ
T01	VTP0113	Power Transformer	1	Δ
SW01	ESD3990S	All OFF Switch	1	Δ
SW02	ESE376	Voltage Select Switch	1	Δ
	VJR4	Clamper	1	
	VEP00C12B	Main P.C. Board Unit	1	
		Integrated Circuit		
IC01	WPC494C		1	
IC02	VCR0054		1	
IC03	VCR0101		1	
		Transistors		
Q01	2SB793A		1	
Q02	2SB953		1	(P,Q,V,B,V,T)
Q06	2SD992		1	Δ
		Diodes		
D01	S4VB		1	Δ
D02	S3S4MF3		1	
D04	MA165		1	
D05	OA95		1	
D07	OA95		1	
D11	S3S4MF1		1	
D17	MA165		1	

Ref. No.	Part No.	Part Name & Description	Pos / Set	Remarks
		Resistors		
R03	ERDS2TJ561	560	1	
R04	ERQ14AJ270	Fuse	27	1 A
R05	ERD25TJ222	2.2K	1	
R06	ERDS2TJ333	33K	1	
R07	ERDS2TJ224	220K	1	
R08	ERDS2TJ223	22K	1	
R10	ERDS2TJ472	4.7K	1	
R12	ERDS2TJ273	27K	1	
R13	ERQ14AJ151	Fuse	150	1 A
R14	ERDS2TJ123	12K	1	
R15	ERDS2TJ124	120K	1	
R16	ERDS2TJ101	100	1	
R17	ERDS2TJ472	4.7K	1	
R18	ERF3AKR39	Cement 3W	0.39	1
R19	ERDS2TJ102	1K	1	
R20	ERX1SJ2R2	Metal 1W	2.2	1
R23	ERDS2TJ273	27K	1	
R24	ERDS2TJ154	150K	1	
R25	ERDS2TJ822	8.2K	1	
R30	ERDS2TJ101	100	1	
R31	ERX2ANJR33	Metal 2W	0.33	1
R36	ERD25TJ182	1.8K	1	
		Variable Resistors		
VR01,02	EVN50AA00B24	20K	2	
VR03	EVN50AA00B53	5K	1	
		Capacitors		
C01	ECQV1H224JZ	Mylar 50V	0.22	1
C02,03	ECKF1H103ZF	Ceramic 50V	0.01	2
C04	ECEA1HU222	Electrolytic 50V	2200	1
C05	ECKF1H103ZF	Ceramic 50V	0.01	1
C06	ECEA1HG101S	Electrolytic 50V	100	1
C07	ECQV1H102KV	Mylar 50V	1000P	1
C08	ECKF1H103ZF	Ceramic 50V	0.01	1
C09	ECQV1H102KV	Mylar 50V	1000P	1
C10	ECEA1EG471S	Electrolytic 25V	470	1
C12	ECEA1ES330	Electrolytic 25V	33	1
C13	ECKF1H103ZF	Ceramic 50V	0.01	1
C14	ECEA1EM102T	Electrolytic 25V	1000	1
C15	ECQV1H224JZ	Mylar 50V	0.22	1
C16	ECEA1EN4R7S	Electrolytic 25V	4.7	1
C18	ECEA1ES470	Electrolytic 25V	47	1
C19	ECEA1CS330	Electrolytic 16V	33	1
C20	ECEA1HS010	Electrolytic 50V	1	1
C22	ECEA1ES100	Electrolytic 25V	10	1
C23	ECEA1ES470	Electrolytic 25V	47	1
C24	ECEA1ES101	Electrolytic 25V	100	1
C26	ECQV1H103JZ	Mylar 50V	0.01	1
C27	ECKF1H103ZF	Ceramic 50V	0.01	1
		Coils		
LO1	VLQ0098	50uH	1	
LO2	ELC15E001	200uH	1	
LO3	VLQ0131	50uH	1	

Ref. No.	Part No.	Part Name & Description	Pos / Set	Remarks
		Connectors		
P01	VJP1142	3P	1	
P03	VJP1146	10P	1	
P04	VJP1221	4P	1	
P05	VJP1148	2P	1	
		Fuses		
F02	XBA2C40TR0	250V 4A	1	A
F03	VSF0038	TH Fuse 110°C	1	
		Miscellaneous		
	VSC1121	Shield Case	1	
	TJC6320	Fuse Holder	2	A
		Front P.C. Board Unit		
		Transistors		
Q03	2SD973		1	
Q04	2SD636		1	or 2SC1684
Q05	2SB641		1	or 2SA564
		Diodes		
D03	MA165		1	
D06	MA4150M		1	
D08	MA165		1	
D10	LN21RCPHL	LED	1	
D13	D1A100		1	
D14,15	MA165		2	
		Resistors		
R11	ERQ14AJ390	Fuse	39	1 A
R26	ERDS2TJ125	1.2M	1	
R27	ERD25TJ122	1.2K	1	
R28	ERD25TJ222	2.2K	1	
R29	ERDS2TJ272	2.7K	1	
R32	ERD25TJ272	2.7K	1	
R33	ERDS2TJ123	12K	1	
R34	ERDS2TJ223	22K	1	
R35	ERDS2TJ563	56K	1	
		Connector		
P02	VJP1148	2P	1	
		Switches		
SW03,04	ESD27170		2	

277477003

Wired Remote Controller

VW-R17E



SPECIFICATIONS

Weight:	175 g
Dimensions:	62(W) × 14(H) × 101(D) mm
Cable Length:	Approx. 5 m

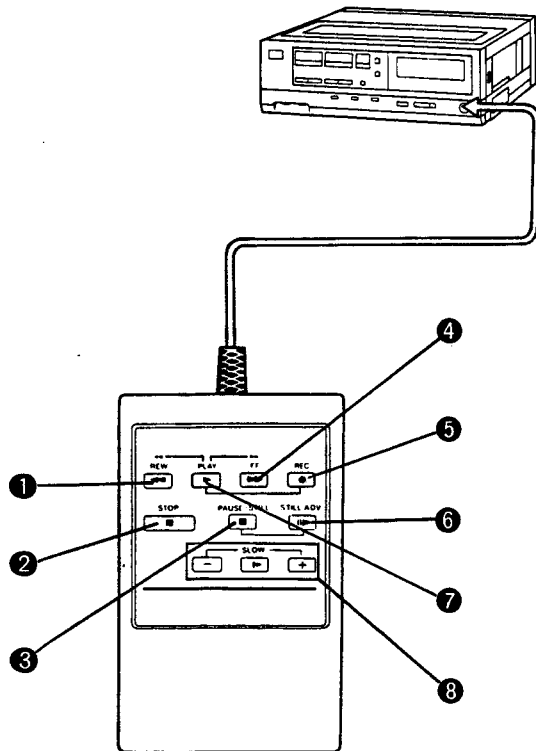
Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

CONTENTS

1. CONTROLS AND COMPONENTS	1
2. SCHEMATIC DIAGRAM	2
3. CIRCUIT BOARD.....	2
4. EXPLODED VIEWS	3
5. MECHANICAL REPLACEMENT PARTS LIST	5
6. ELECTRICAL REPLACEMENT PARTS LIST	5

1. CONTROLS AND COMPONENTS



7 PLAY Button

Press this button to playback recorded tapes.

8 Slow-Motion Buttons

First press the SLOW Button (▶) during playback to view a slow-motion picture. Press the "+" or "-" button to increase or decrease the speed of the SLOW-MOTION picture.

-	▶	+
1/25 ~ 1/5 ~ 1/3		

1 Rewind/Review Button

Press this button to rewind tape. During the play mode pressing this button will allow you to view the tape in reverse at about 7 times the recorded tape speed.

2 STOP Button

Press this button to stop the tape.

3 PAUSE/STILL Button

Press this button to temporarily stop the tape movement in either the recording or playback mode. During playback, a super still picture is produced when the pause is in use. Press again to release pause.

4 Fast Forward/Cue Button

Press this button to move the tape forward rapidly. During the play mode pressing this button will allow you to view the tape in the forward direction at about 7 times the recorded tape speed.

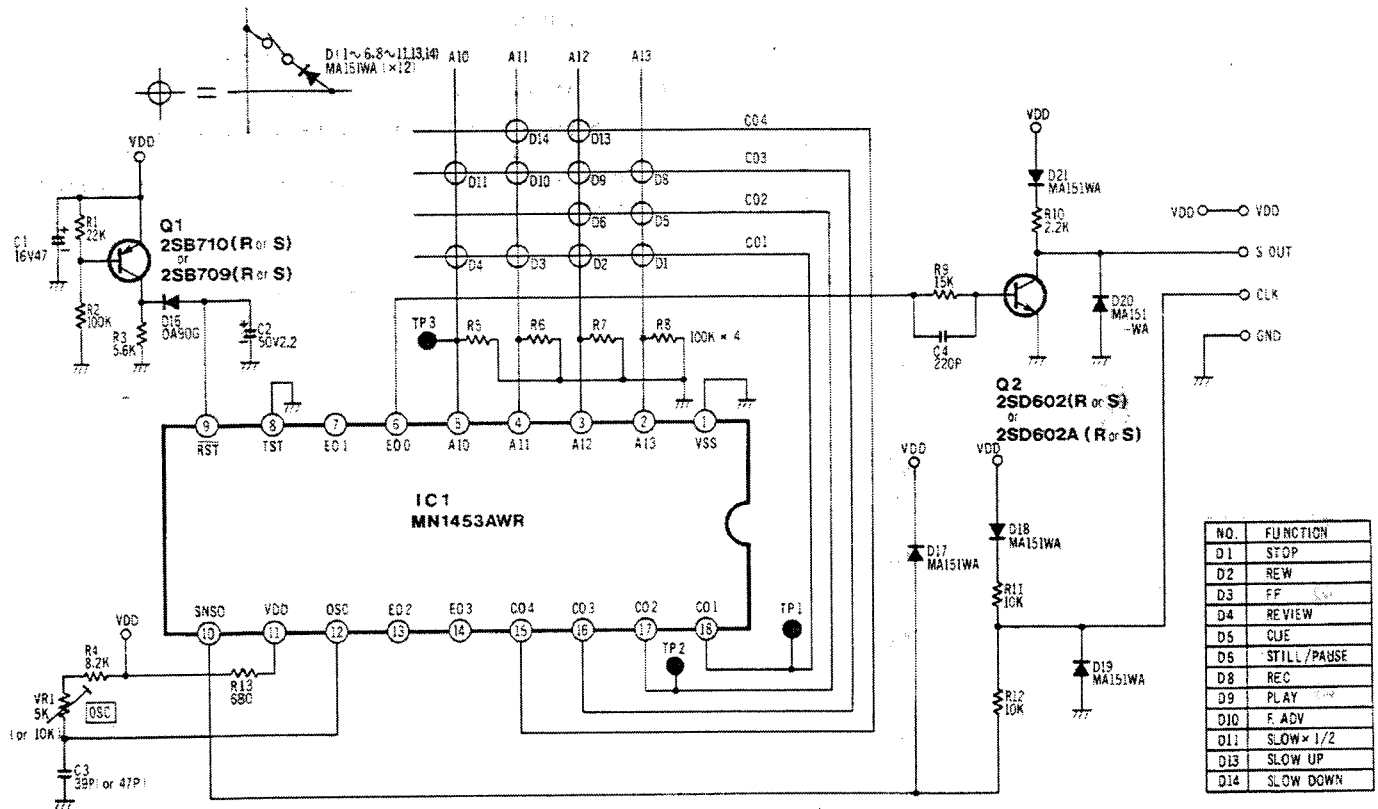
5 REC Button

Recording is started by pressing this button and the PLAY Button at the same time.

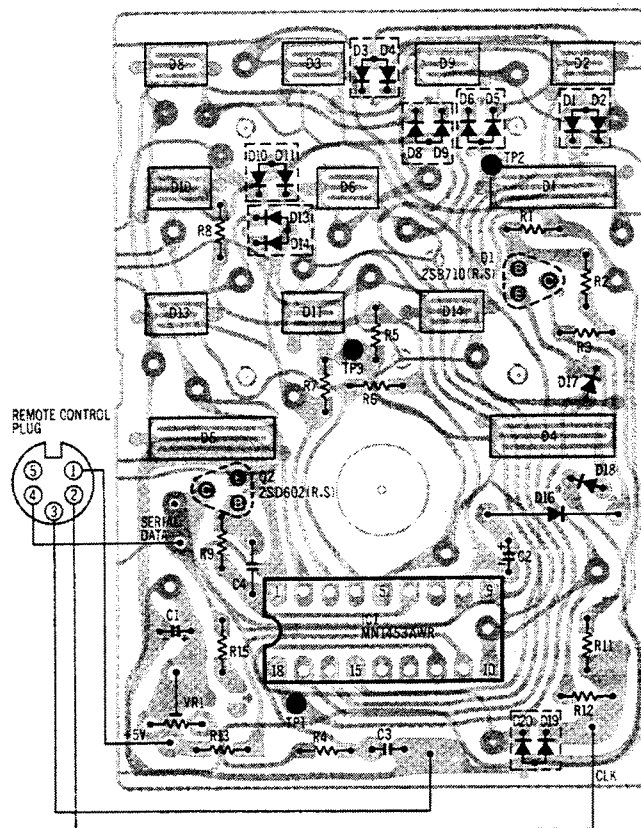
6 STILL ADV Button

During viewing of super still picture, press this button to advance the picture one frame at a time. Slow motion effects are obtainable by holding down the STILL ADV button (about 1/17 speed of normal playback).

2. SCHEMATIC DIAGRAM

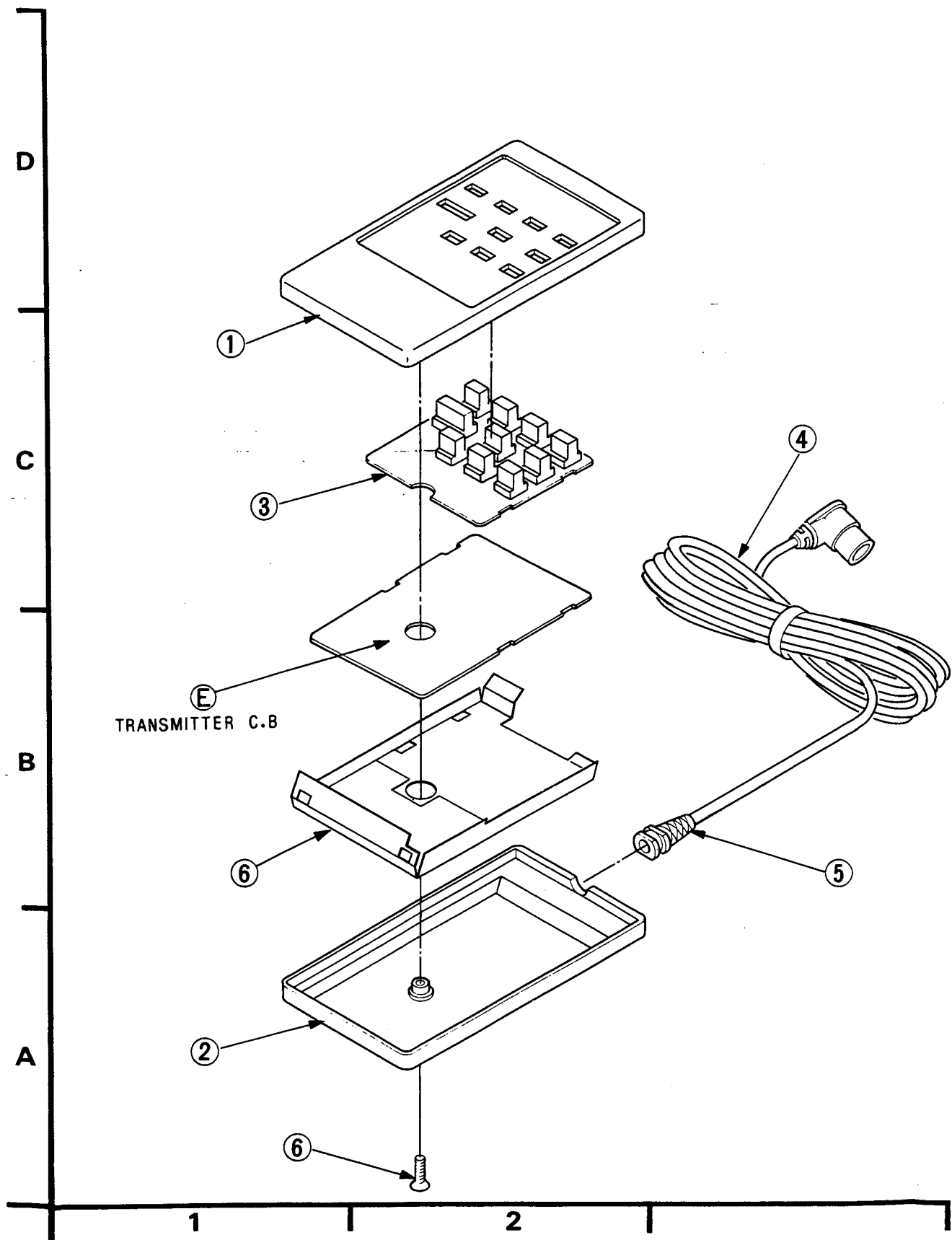


3. CIRCUIT BOARD

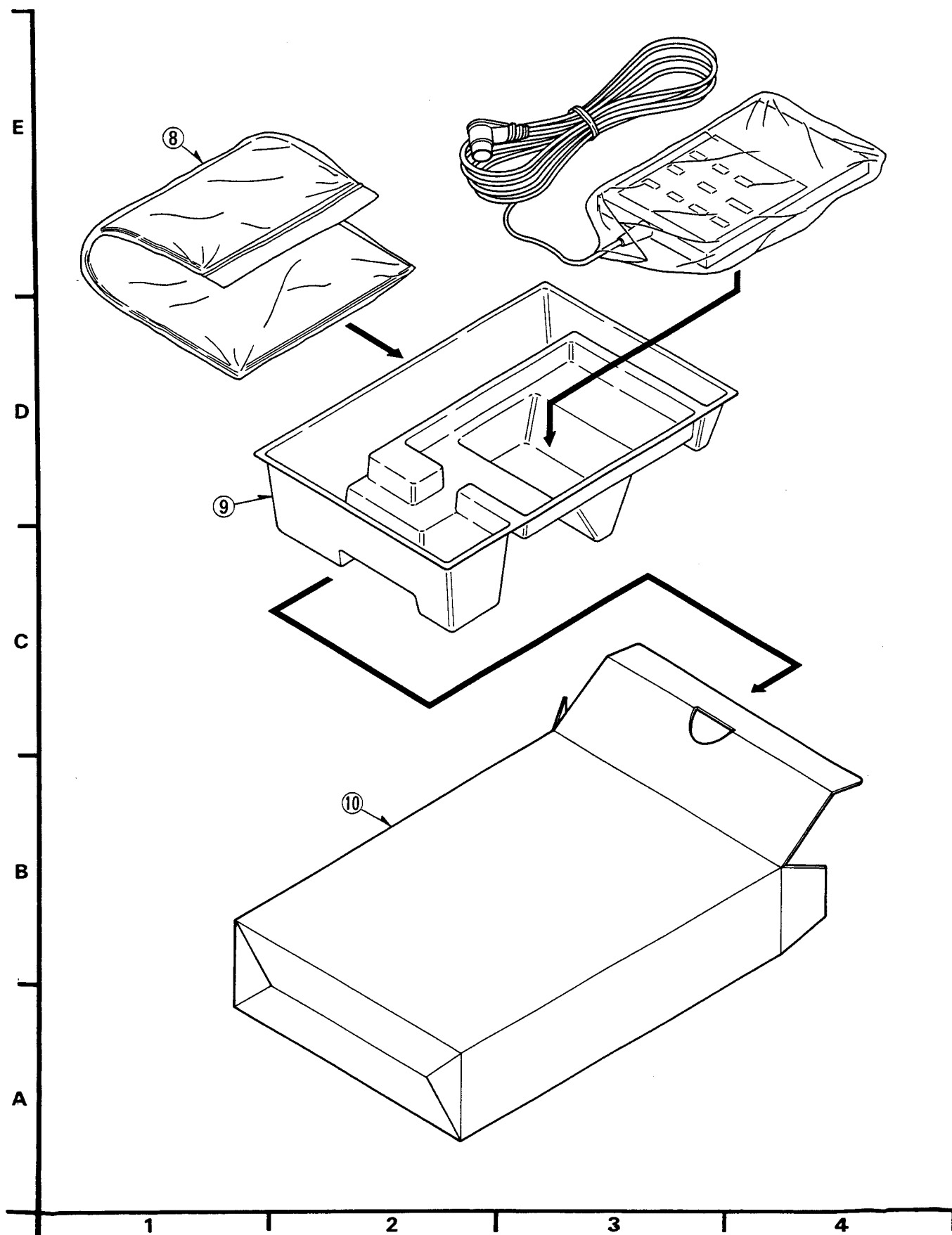


4. EXPLODED VIEW

① REMOTE CONTROL UNIT



② PACKING PARTS SECTION



Plug In AC Adaptor

VW-A11^E_B



SPECIFICATIONS

Power Source: 100~240 V AC, 50/60 Hz
Power Consumption: 25 W
DC OUT: 12 V 1.2 A
Weight: 0.35 kg
Dimensions: 24(W) × 62(H) × 182(D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

CONTENTS

1. ELECTRICAL ADJUSTMENT PROCEDURES.....	1
2. BLOCK DIAGRAM	1
3. SCHEMATIC DIAGRAM	2
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5. EXPLODED VIEWS	4
6. MECHANICAL REPLACEMENT PARTS LIST	5
7. ELECTRICAL REPLACEMENT PARTS LIST	5

1. ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete electrical adjustment procedures which may be required for electrical circuit of the Plug In AC Adaptor VW-A11.

1-1 TEST EQUIPMENTS

To perform the electrical adjustments completely, following equipments are required.

- 1. D.V.M. (Digital Volt Meter)
Voltage Range: 0.01 ~ 50 V
- 2. DC A.M. (DC Ammeter)
Current Range: 0 ~ 10 A
- 3. Resistor (20Ω variable/5 W)
- 4. Resistor (470Ω/1 W)

1-2. OUTPUT VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
ELECTRODE (+), (-)	VR202	POWER SUPPLY	
TAPE	M. EQ.	SPEC.	
	D.V.M DC A.M.		13.5 ± 0.5 V

1. Make the connection as shown below.

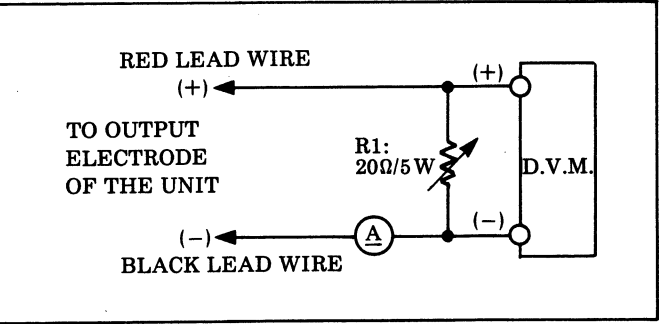


Fig. 1

2. Adjust R1 (20Ω variable/5 W) so that the indication of the DC A.M. is 1.2 A.
3. Adjust VR202 so that the indication of the D.V.M. is 13.5 ± 0.5 V.

Note:

After making this adjustment, readjust the CHARGE VOLTAGE (VR201).

1-3. CHARGE VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
PLUG CORD (+), (-)	VR201	CHARGE	
TAPE	M. EQ.	SPEC.	
	D.V.M. DC A.M.		$-\frac{3}{100}t + 15.45$ (V) t: Ambient Temperature (°C)

1. Connect the Battery Charging Cord to the socket of this unit and make the connection as shown below.

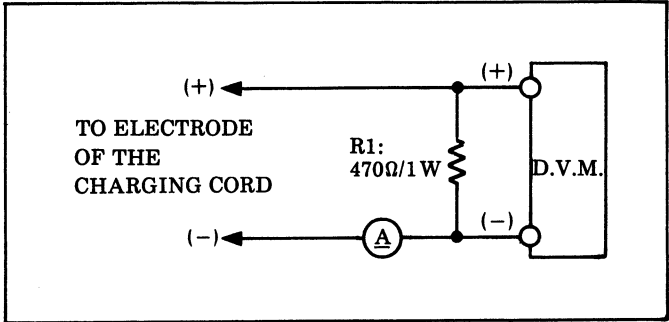
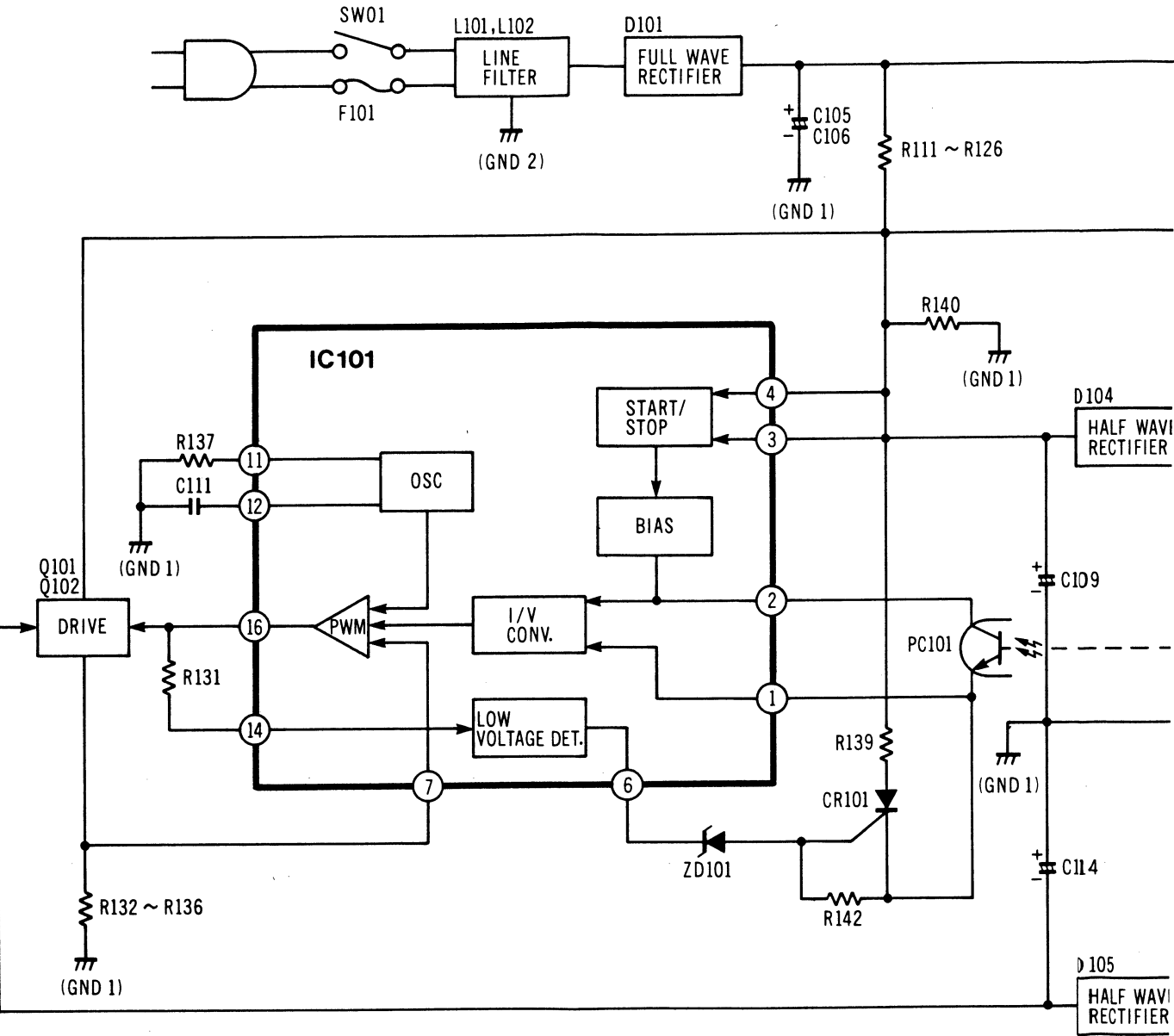


Fig. 2

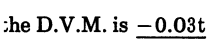
2. Adjust VR201 so that the indication of the D.V.M. is -0.03t + 15.45 V DC.

2. BLOCK DIAGRAM

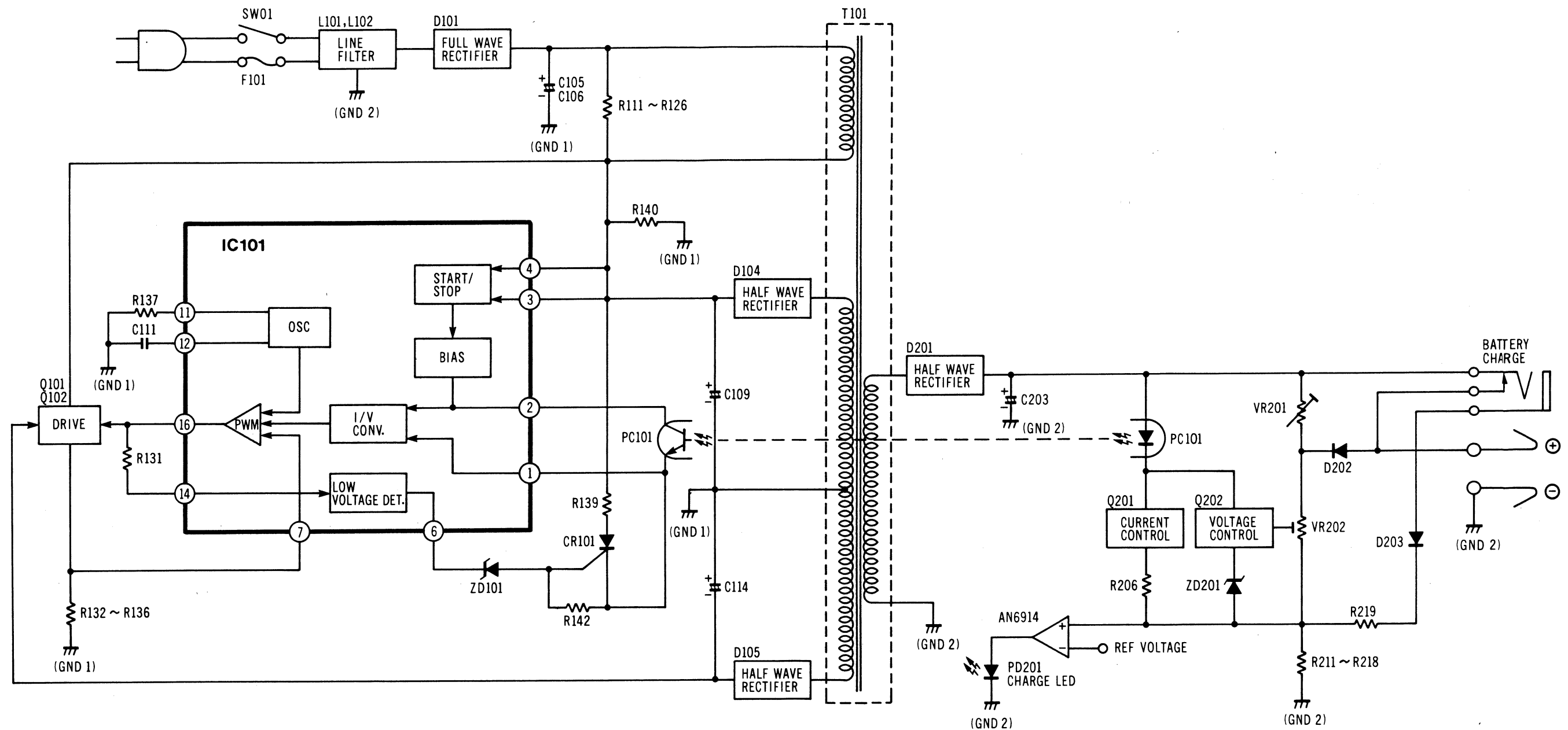


STATEMENT

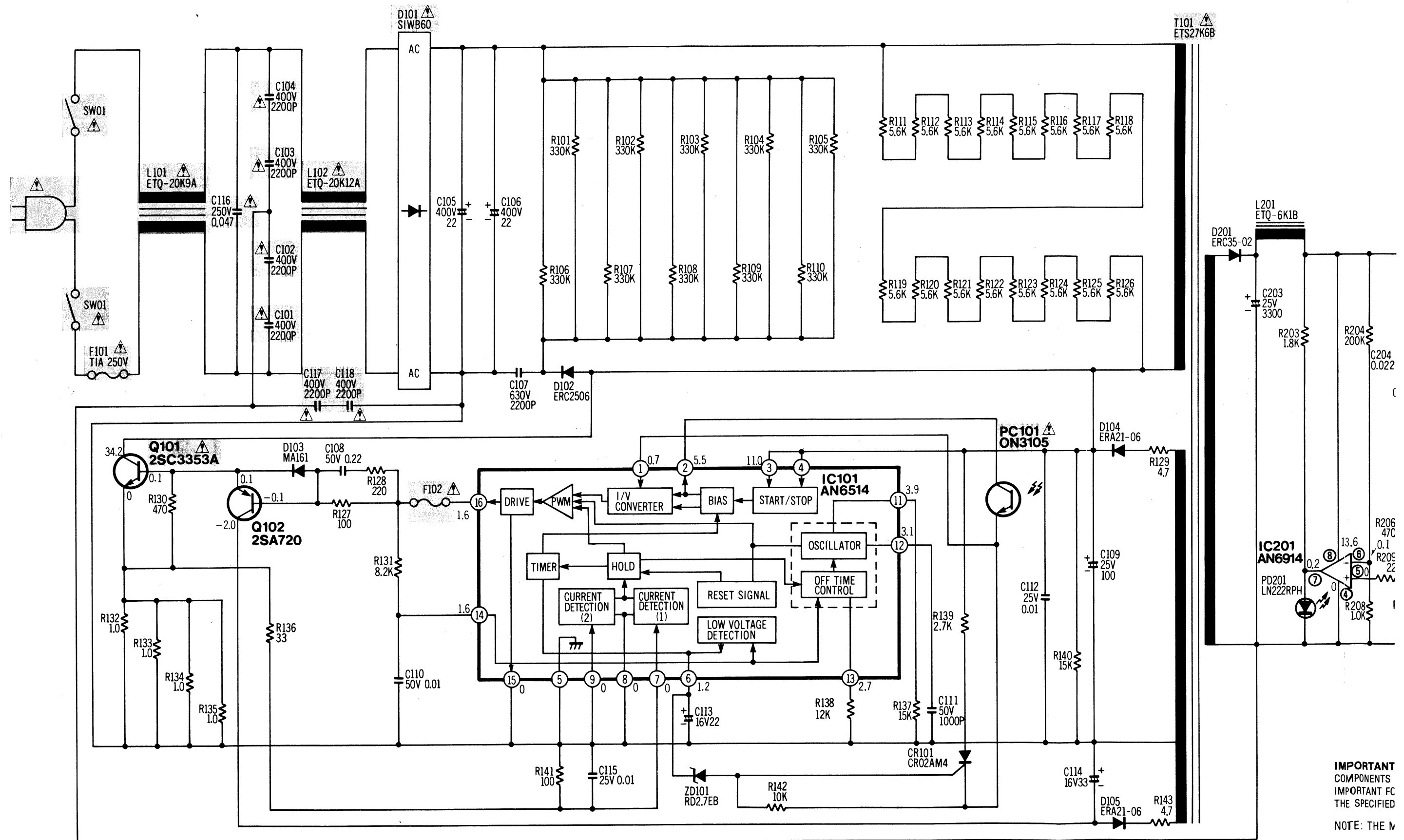
he socket of this unit
w.

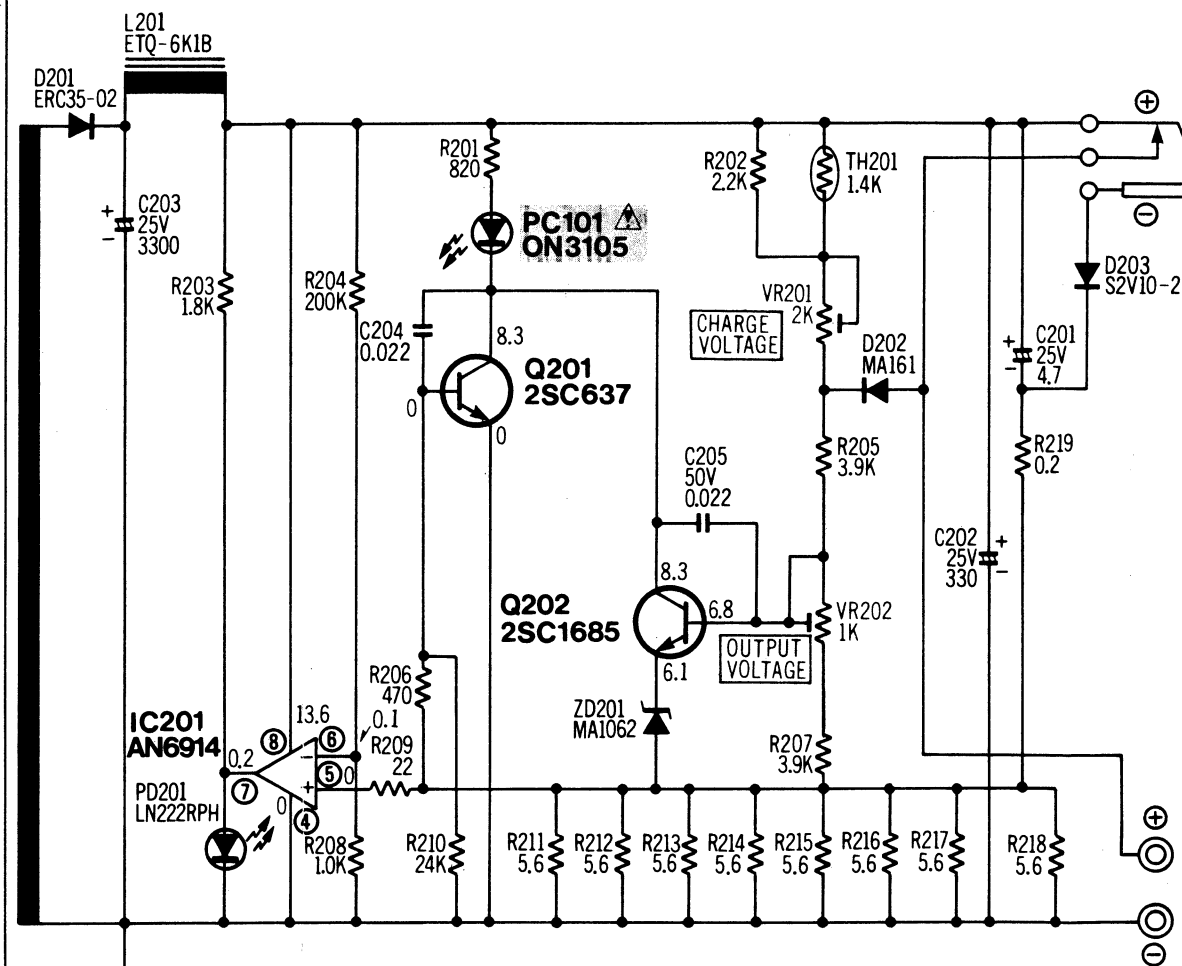
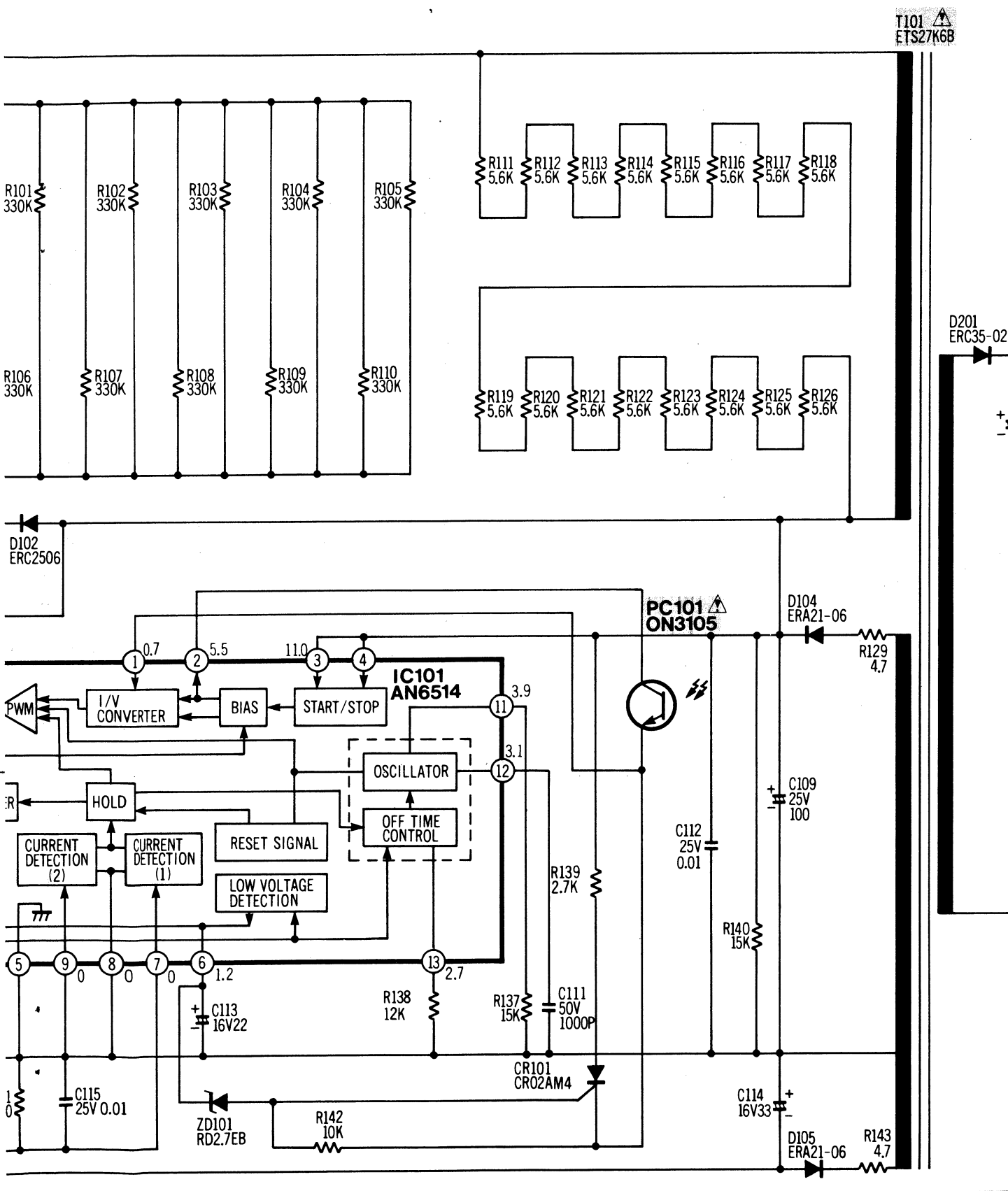


Next Page:
SCHEMATIC DIAGRAM

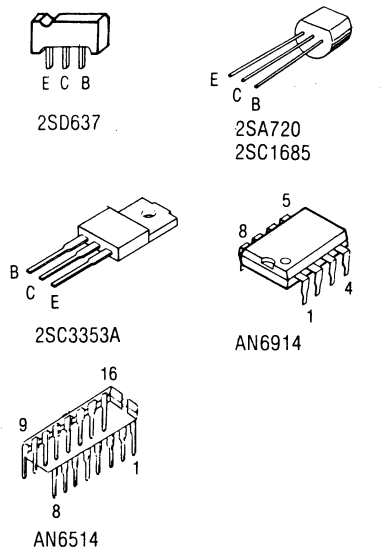


3. SCHEMATIC DIAGRAM





ICs & TRANSISTORS INFORMATION



IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN  HAVE SPECIAL CHARACTERISTICS
IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY
THE SPECIFIED PARTS.

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS DECK MODE.

3. ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete electrical adjustment procedures which may be required for electronic circuit of the AC Adaptor VW-A18.

3-1. TEST EQUIPMENTS

To perform the electrical adjustments completely, following equipments are required.

1. D.V.M. (Digital Volt Meter)
Voltage Range: 0.001 ~ 50 V
2. Oscilloscope
Voltage Range: 0.005 ~ 50 V/div.
3. DC A.M. (DC Ammeter)
Current Range: 0 ~ 10 A
4. DC V.M. (DC Voltmeter)
Voltage Range: 0 ~ 20 V
5. Plastic Tip Driver
6. Resistor (11Ω/120 W)
7. DC Power Supply (5 A/20 V)
8. Resistor (5Ω variable/200 W)

3-2. POWER SUPPLY OUTPUT VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
MULTI CONNECTOR (1) (+) (11) (-)	VR01	POWER SUPPLY	
TAPE	M. EQ.	SPEC.	
	D.V.M		13.85 ± 0.5 V

1. Connect a jumper wire between pin (1) and pin (17) of the Multi Connector for make the unit in power supply mode.
2. Connect the resistor (11Ω/120 W) between pin (1) and pin (11) of the Multi Connector.

3-3. INCIPIENT CHARGE CURRENT AND SCHMITT VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
MULTI CONNECTOR (1) (+) (11) (-)	VR02 VR03	CHARGE	
TAPE	M. EQ.	SPEC.	
	DC AM D.V.M.		$I = 1.40 - 0.002 (25 - t) \pm 0.02 \text{ A (VR02)}$ $V = -0.03t + 16.05 \pm 0.1 \text{ V (VR03)}$ t : Ambient temperature [0°C]

1. Make the connection as shown below.

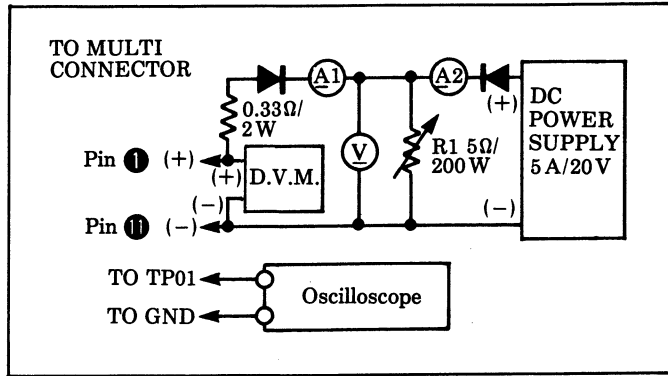
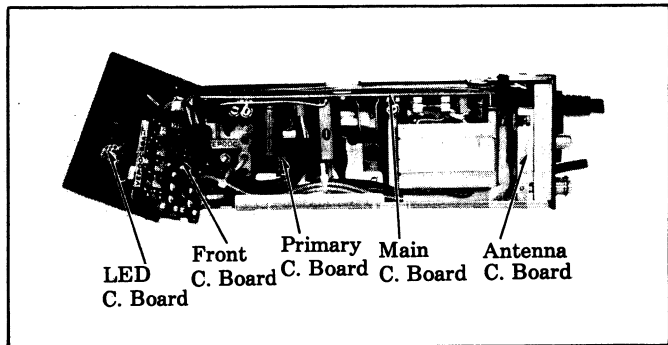


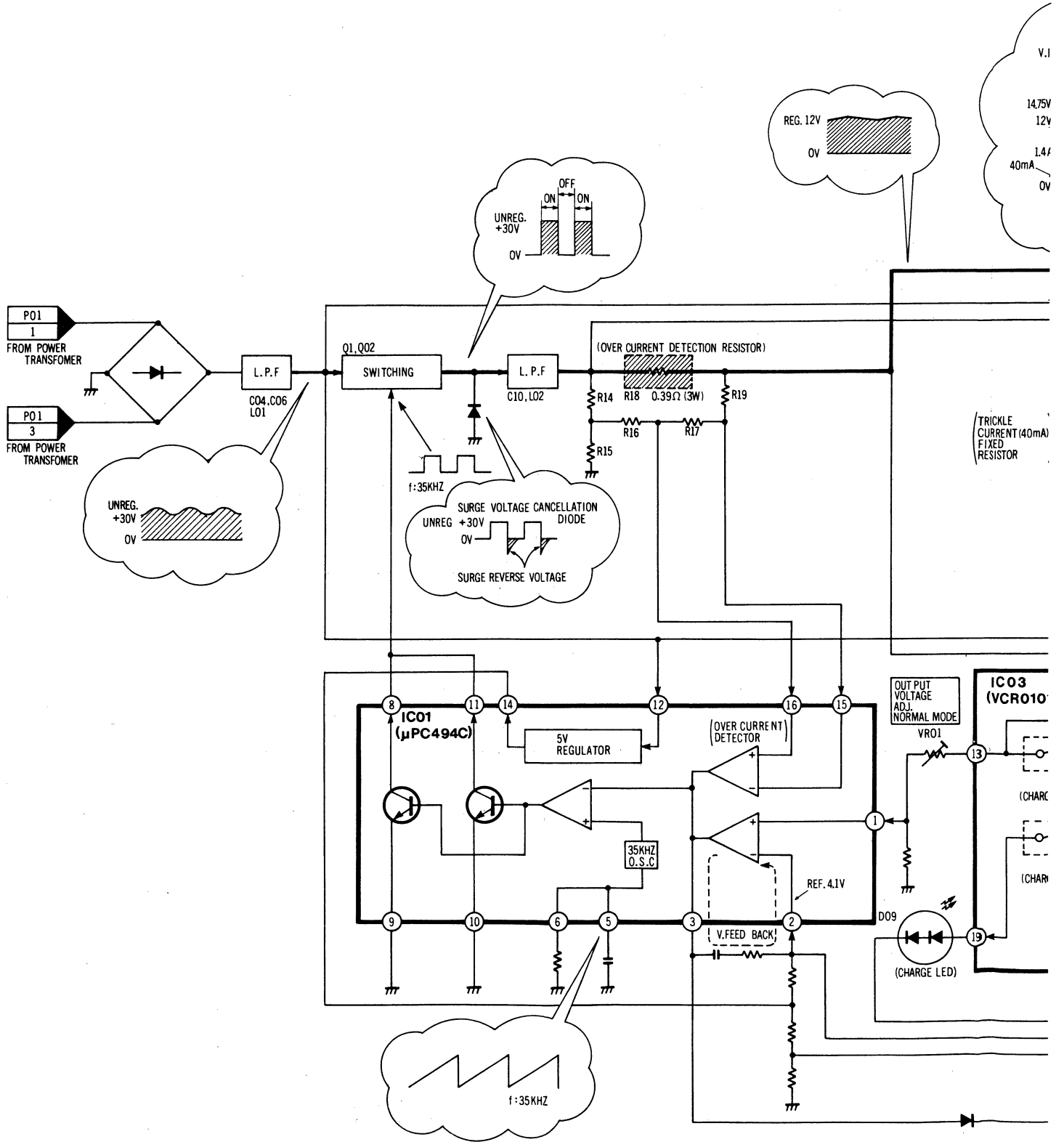
Fig. 8

2. Adjust the output of the DC power supply so that the indication of the DC V.M. becomes 14.0 V and adjust R1 so that the indication of the DC A.M. (A2) becomes 3.0 [A].
3. Adjust VR02 so that the indication of the DC A.M. (A1) becomes $1.40 - 0.002 (25 - t) \pm 0.02 \text{ [A]}$.
4. Adjust the output level of the DC power supply till the indication of the oscilloscope becomes "Low" (about 0.5 V) from "High" (about 15.0 V).
5. If the value which was read in item 4 is not $-0.03t \pm 16.05 \pm 0.1 \text{ V}$, turn VR03 clockwise or counterclockwise.

4. CIRCUIT BOARD LAYOUT

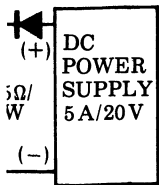


5. BLOCK DIAGRAM



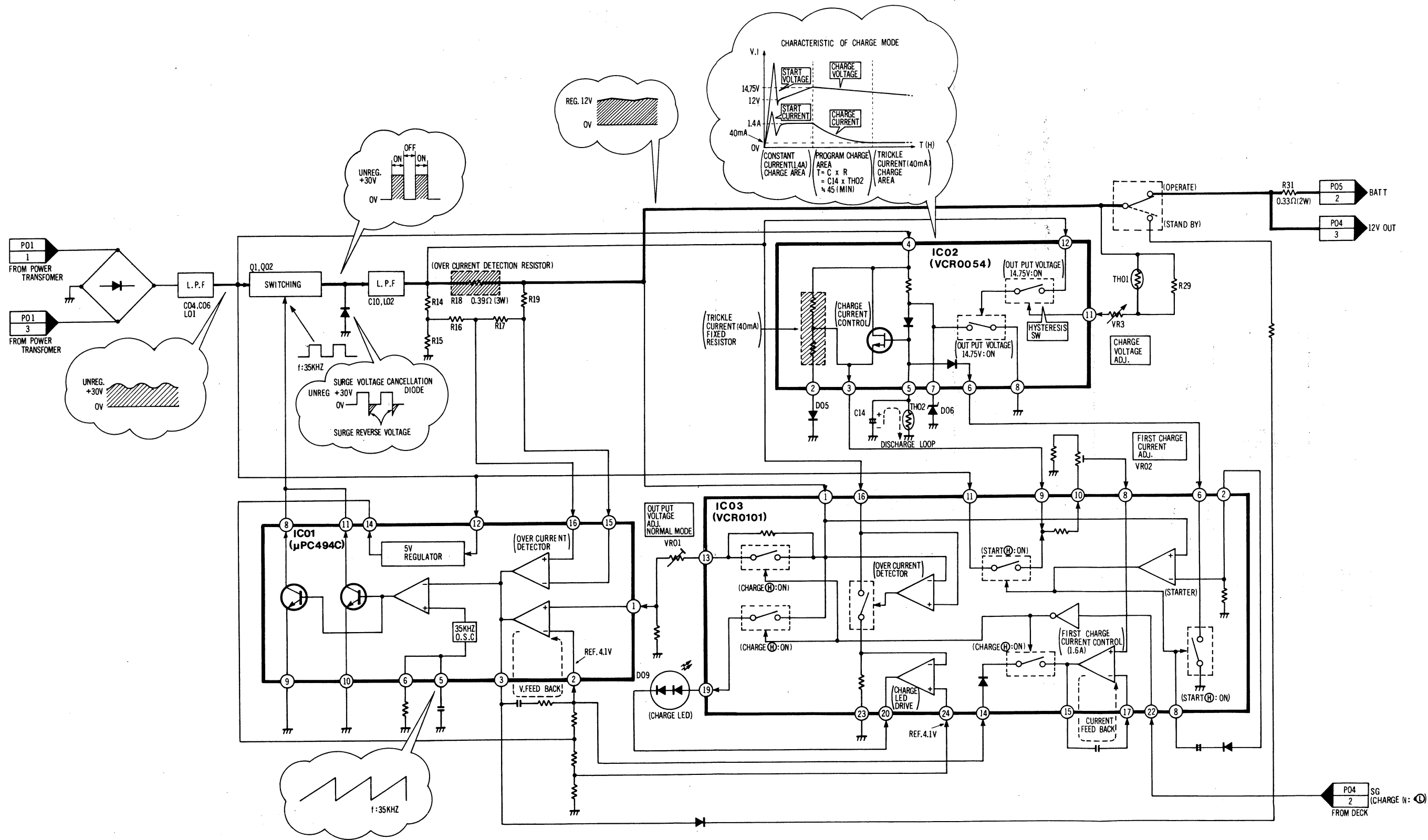
5. BLOCK DIAGRAM

ELECTRICAL ADJUSTMENT PROCEDURES
CIRCUIT BOARD LAYOUT
BLOCK DIAGRAM



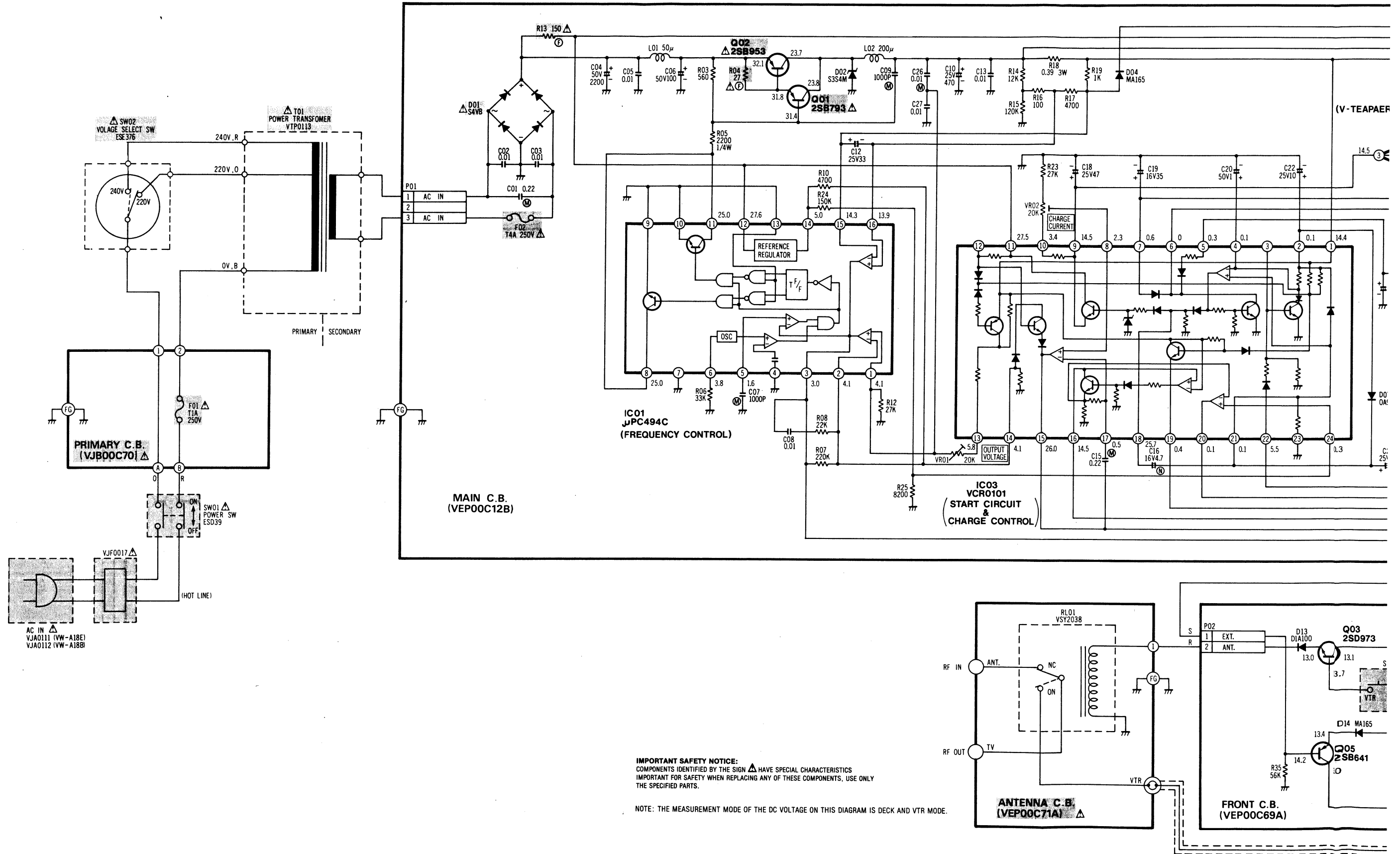
that the indica-
st R1 so that the
[A].
e DC A.M. (A1)
ly till the indica-
out 0.5V) from
-0.03t ± 16.05 ±
vise.

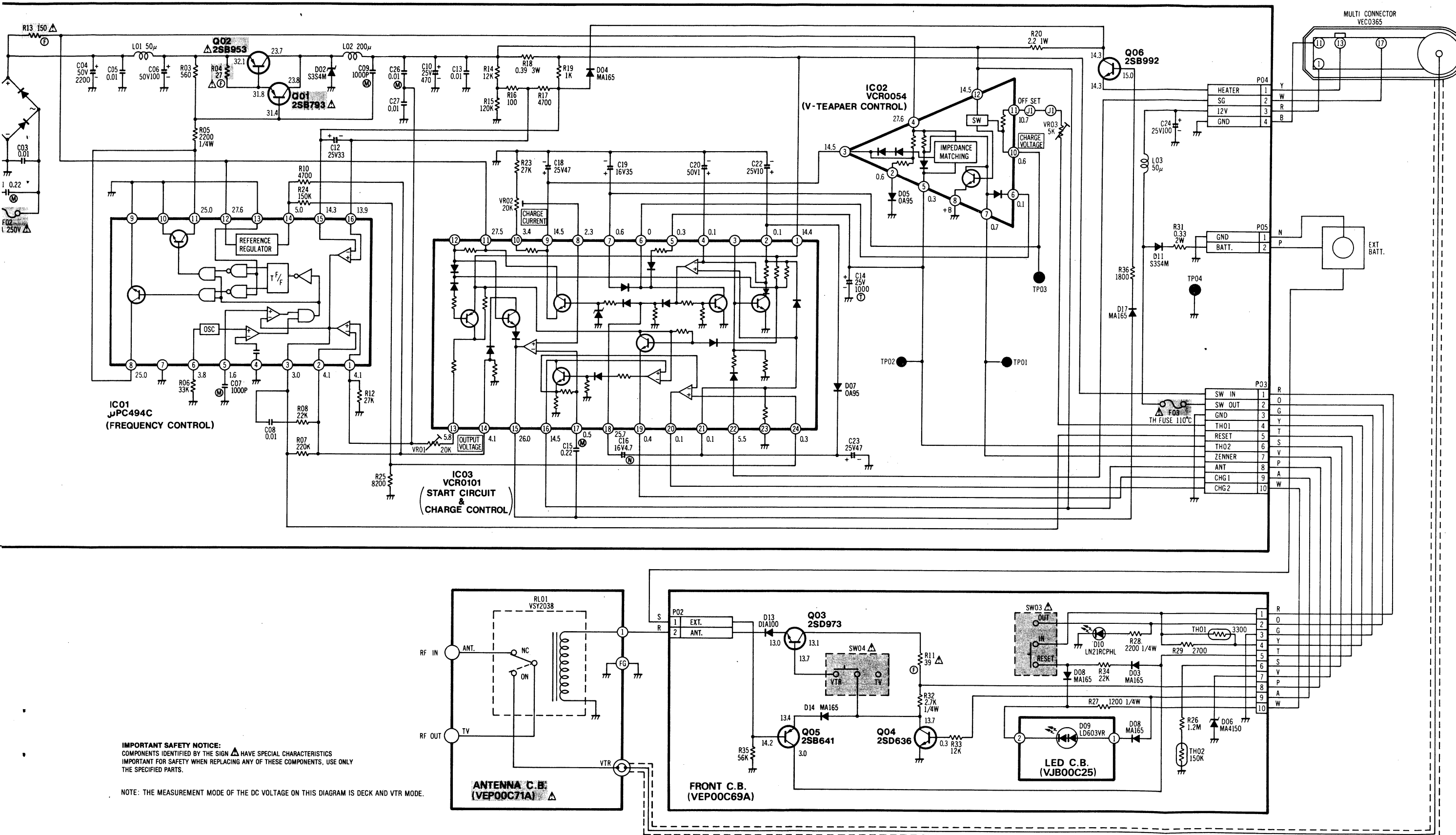
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Next Page:
SCHEMATIC DIAGRAM

6. SCHEMATIC DIAGRAM





6. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. • Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)	VJA0111	AC Cord	1	VW-A11E Δ
1(1)	VJA0112	AC Cord	1	VW-A11B Δ
2(1)	VYK0776	Case Unit	1	VW-A11E
2(1)	VYK0775	Case Unit	1	VW-A11B
3(1)	VKM0295	Cover (A)	1	
4(1)	VKM0296	Cover (B)	1	
5(1)	VMZ0595	Insulator (C)	1	Δ
6(1)	VMZ0596	Insulator (D)	1	Δ
7(1)	VMZ0597	Insulator (E)	1	Δ
8(1)	VMZ0574	Insulator (B)	1	Δ
9(1)	VJP0017	Cord Bushing	1	Δ
10	VJR0116	Earth Angle	1	
11(1)	VQL1919	Switch Label	1	Δ
12(2)	ESE3553	Antenna Select Switch	1	
13(2)	XZB1ZX23C05	Polyethylene Bag	1	
14(2)	VJA0180	Battery Charging Cord	1	
15(2)	VJA0242	Antenna Cable	1	
16(2)	VQF1253	Fan Bag Kit	1	VW-A11E Δ
16(2)	VQF1254	Fan Bag Kit	1	VW-A11B Δ
17(2)	VPG1785	Packing Case	1	VW-A11E
17(2)	VPG1786	Packing Case	1	VW-A11B
		Screw		
31(1)	XSS3+55		2	
32(1)	XTS3+16BFYJS		1	

7. ELECTRICAL REPLACEMENT PARTS LIST

Notes: 1. • Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified.
All resistors are in OHMS (Ω), 1/4W $\pm$ 5% carbon. K=1,000K, M=1,000K Ω . All capacitors are in MICROFARADS (μ F), $\pm$ 10% P= μ F.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP21071A	Plug In AC Adaptor	1	
		P.C. Board Unit		
		Integrated Circuits		
IC101	AN6514		1	
IC201	AN6914		1	
		Transistors		
Q101	2SC3353A		1	Δ
Q102	2SA720		1	(Q,R)
Q201	2SD637		1	(Q)
Q202	2SC1685		1	(Q)
		Diodes		
D101	SIWB60	600V 0.6A	1	Δ
D102	ERC25-06	600V 1.2A	1	
D103	MA161	50V 0.1A	1	
D104,105	ERA21-06	600V 0.5A	2	
D201	ERC35-02	200V 2.5A	1	
D202	MA161	50V 0.1A	1	
D203	S2V10		1	
		Zener Diodes		
ZD101	RD2.7EB		1	
ZD201	MA1062		1	
		Photo Diode		
PD201	LN222RPH		1	
		Resistors		
R101-110	ERD25TLJ334	Chip 330K	10	
R111-126	ERD25TLJ562	Chip 5.6K	16	
R127	ERD25TLJ101	Chip 100	1	
R128	ERD25TLJ221	Chip 220	1	
R129	ERD25TLJ4R7	Chip 4.7	1	
R130	ERD25TLJ471	Chip 470	1	
R131	ERD25TLJ822	Chip 8.2K	1	
R132-135	ERD25TLJ1R0	Chip 1	4	
R136	ERD25TLJ330	Chip 33	1	
R137	ERD25TLJ153	Chip 15K	1	
R138	ERD25TLJ123	Chip 12K	1	
R139	ERD25TLJ272	Chip 2.7K	1	
R140	ERD25TLJ153	Chip 15K	1	
R141	ERD25TLJ101	Chip 100	1	
R142	ERD25TLJ103	Chip 10K	1	
R143	ERQ14LK4R7	Fuse 0.25W 4.7	1	
R201	ERD25TLJ821	Chip 820	1	
R202	ERD25TLJ222	Chip 2.2K	1	
R203	ERD25TLJ182	Chip 1.8K	1	

Service Manual

Supplement

Effective from: First Production

Video Product

Model No. NV-180 Series

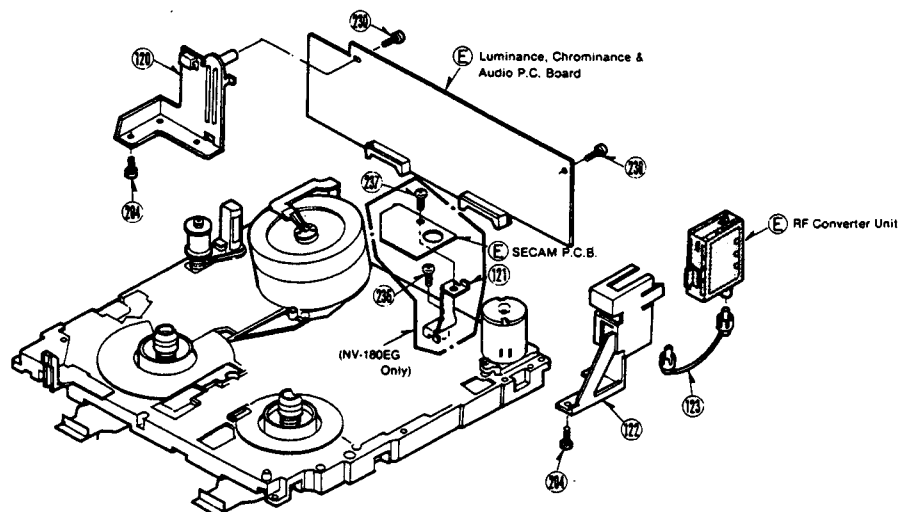
Subject: Correction of Mechanical Parts

Please use this manual together with the Service Manual for Order No. VRD8404503, VRD8405573
Model No. NV-180 Series

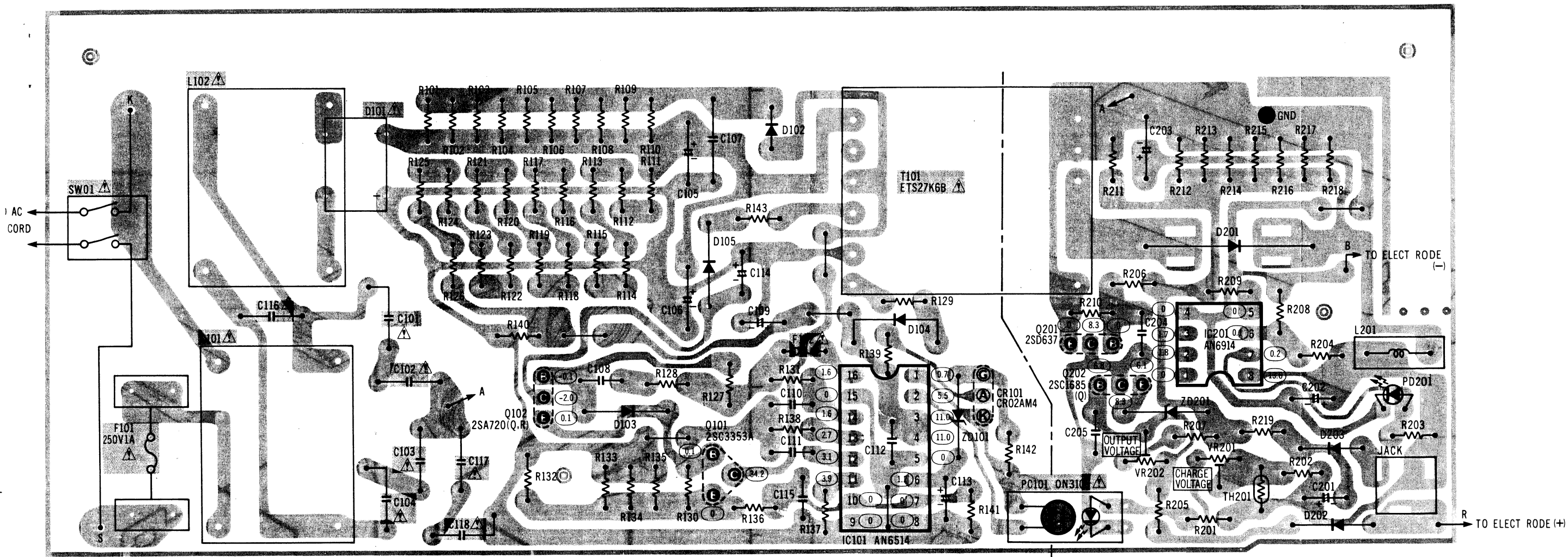
Please correct the following Part Number in Parts List.

Interchangeability Code				See the I/C column on the following Part Number list.									
A	Parts	Set Production	B	Parts	Set Production	C	Parts	Set Production	D	Parts	Set Production	E	Addition
	Original	Early		Original	Early		Original	Early		Original	Early	F	Deletion
	New	Late		New	Late		New	Late		New	Late	G	Other
Part Number													
Ref. No.		Original Part No.		New Part No.		Part Name & Descriptions				I/C	Remarks		
120 (3)		VMD0600		VMD0599		Back Frame (L)				G			
122 (3)		VMD0599		VMD0600		Back Frame (R)				G			

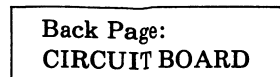
③ CHASSIS PARTS, CASSETTE UP MECHANISM & CASING PARTS SECTION



4. CIRCUIT BOARD

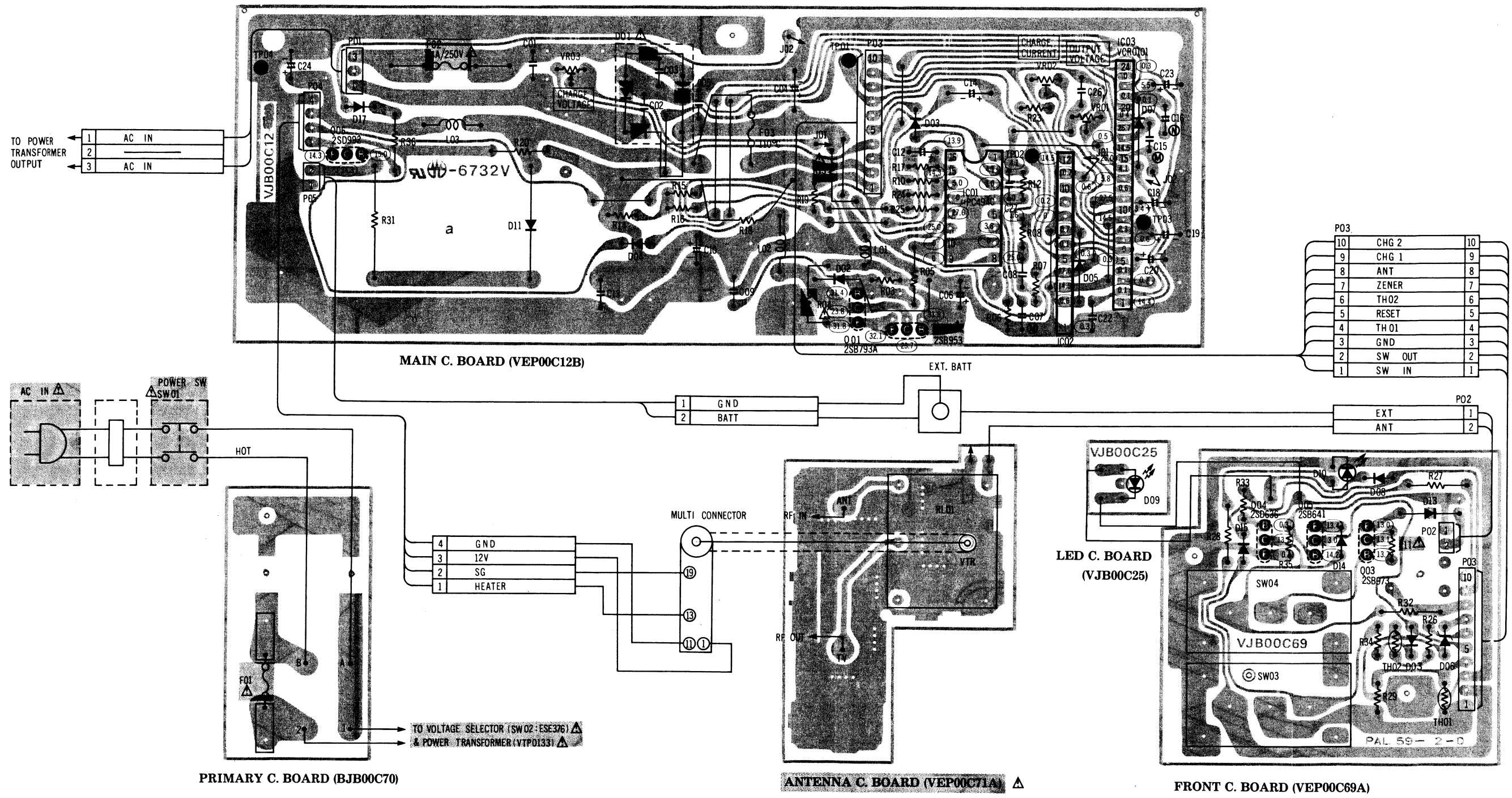


① CHASSIS & FRAME SECTION

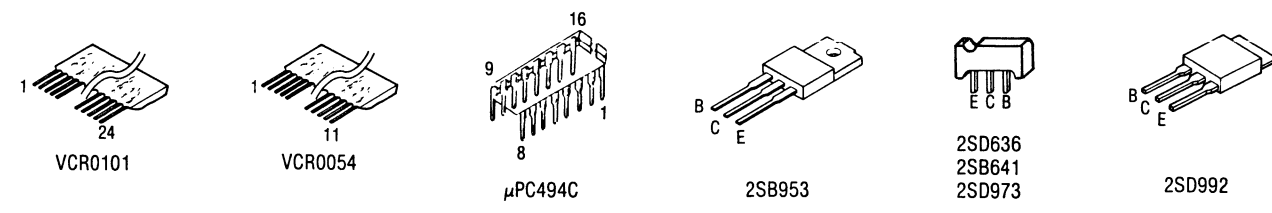


This exploded view diagram illustrates the assembly of a 5-bay rackmount chassis. The components are numbered 12 through 17. The chassis (17) is shown at the bottom with five bays. The hard drive (13) is positioned in the center bay, with its power cable (15) and data cable (14) connected to the back. The power supply (12) is shown to the right, connected to the chassis. The floppy disk drive (16) is shown at the top, connected to the chassis. The diagram includes a vertical scale on the left (A to F) and a horizontal scale at the bottom (1 to 5).

7. CIRCUIT BOARDS

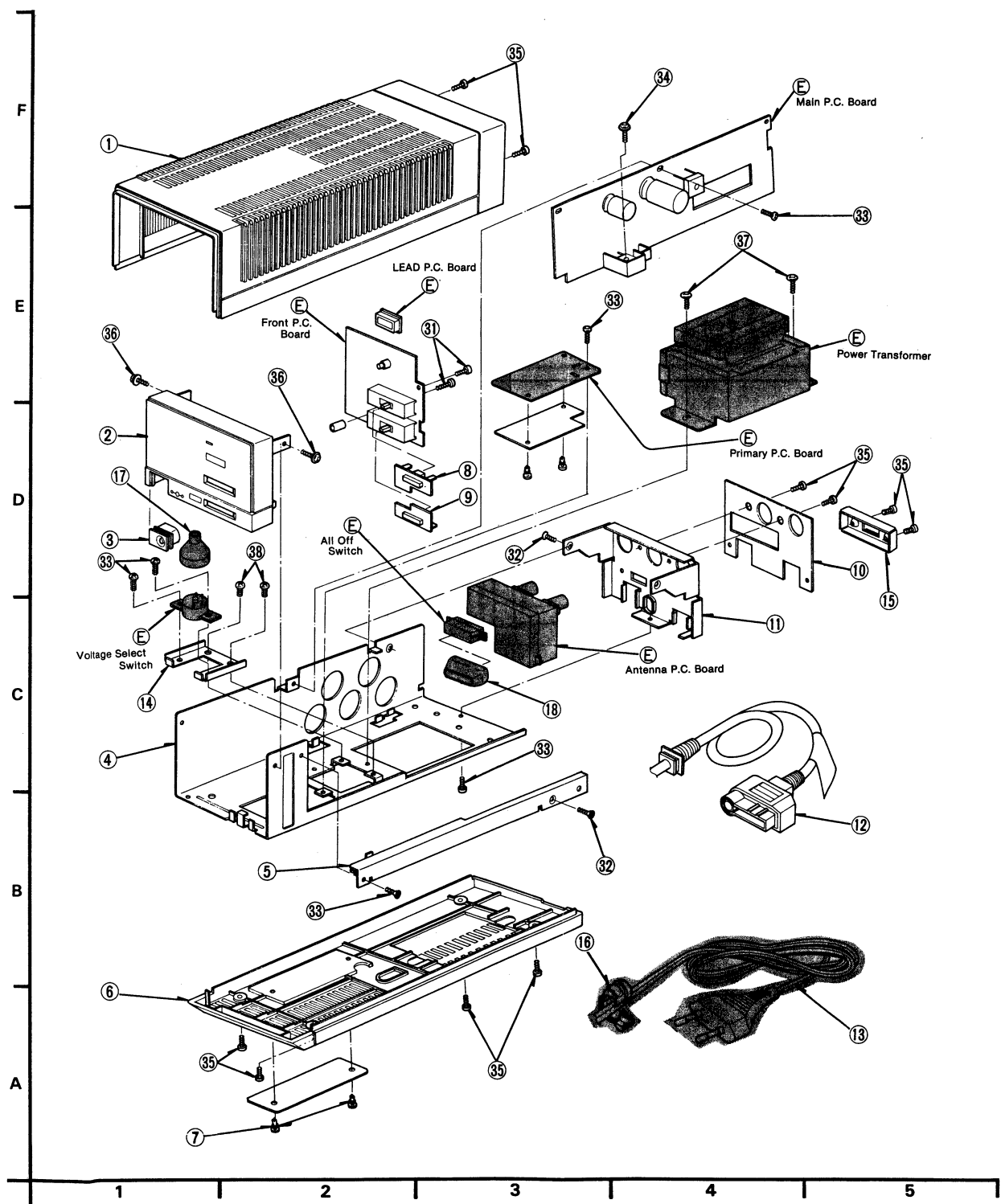


ICs & TRANSISTORS INFORMATION



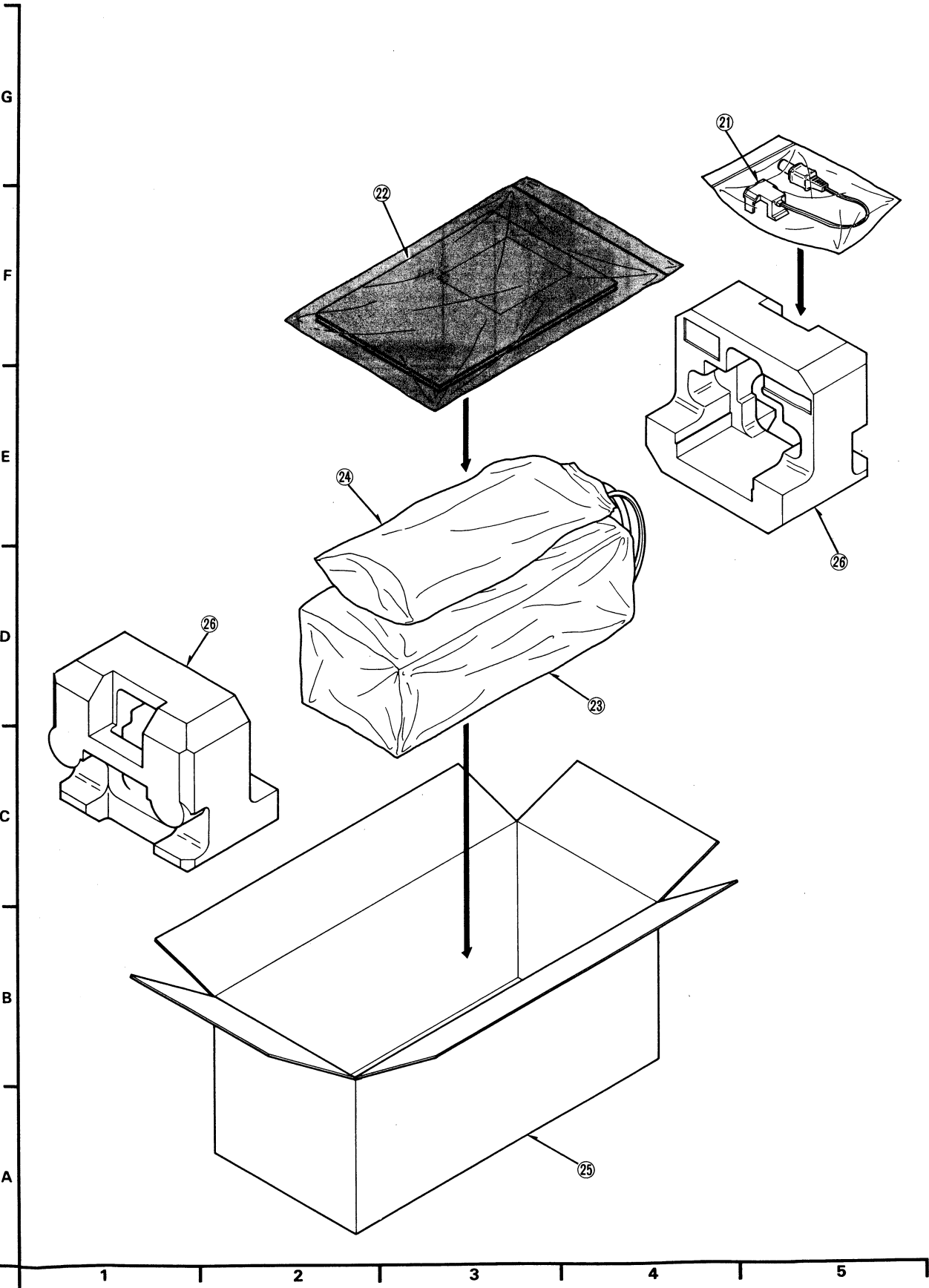
8. EXPLODED VIEWS

1 CHASSIS & FRAME SECTION



Back Page:
CIRCUIT BOARD

2 PACKING PARTS SECTION



Service Manual



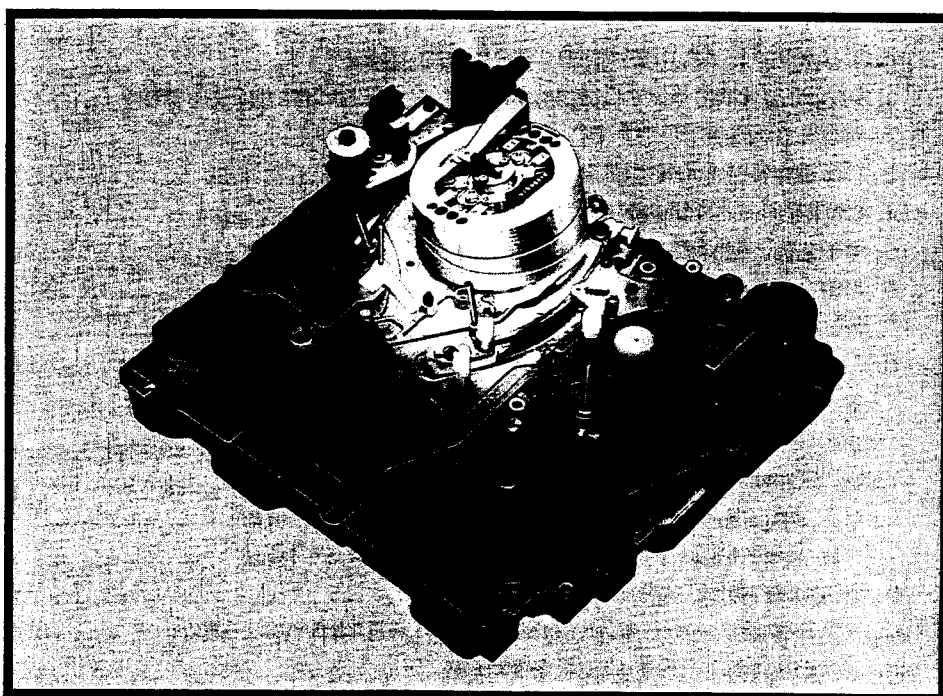
V10219



Video Cassette Recorder
Mechanical chassis

No. FT

Mechanical Adjustment
Procedures



IMPORTANT

The FT mechanical chassis is built in the several NATIONAL/
PANASONIC VHS Video Cassette Recorders.

Thus, properly file this service manual with the service manuals
of the relative video cassette recorders.

(Main applicable models: NV-180)

INTRODUCTION

This Service Manual describes the mechanical adjustment procedures needed for properly adjusting the FT Mechanical Chassis used for the NATIONAL/PANASONIC VHS Video Tape Recorders.

Mechanical adjustment procedures needed for these VHS VTRs incorporating the FT Mechanical Chassis are described in the Mechanical Adjustment Section of the Service Manuals related to respective VTR models.

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MECHANICAL ADJUSTMENT PROCEDURES

1. PROCEDURE FOR CLEANING OF UPPER CYLINDER UNIT

1. Position the video head to permit access for cleaning and hold the upper cylinder to keep it from turning while cleaning.
2. Gently rub the video head in direction of tape travel with Head Cleaning Stick moistened with Freon TF.
3. Repeat for the other video head.

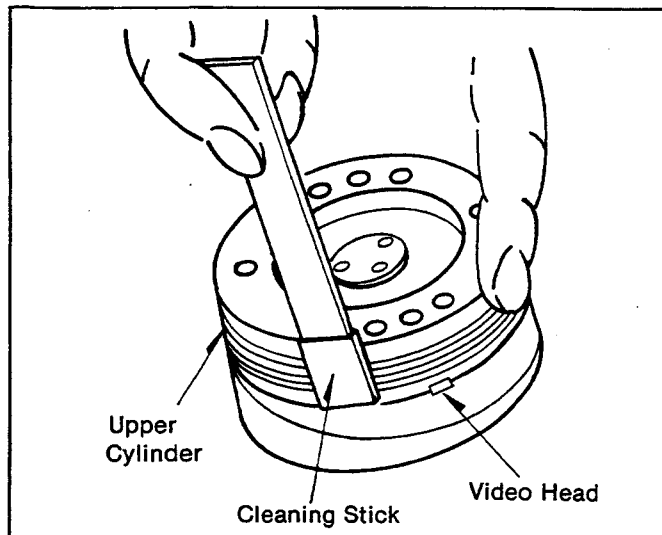


Fig. 1 Head Cleaning

Notes:

1. Do not rub vertically.
2. Do not apply any pressure to head.
If contaminant is not easily removed, continued gentle wiping will usually remove the substance.
3. Do not rotate the Upper Cylinder Unit clockwise when cleaning it.

2. REPLACEMENT OF DD CYLINDER UNIT

Work with extreme care when removing or replacing the DD cylinder unit.

Do not touch video heads during servicing.

1. Remove the screw (A) and the Grounding Spring, then remove the screw (B) and the Grounding Plate Bracket.

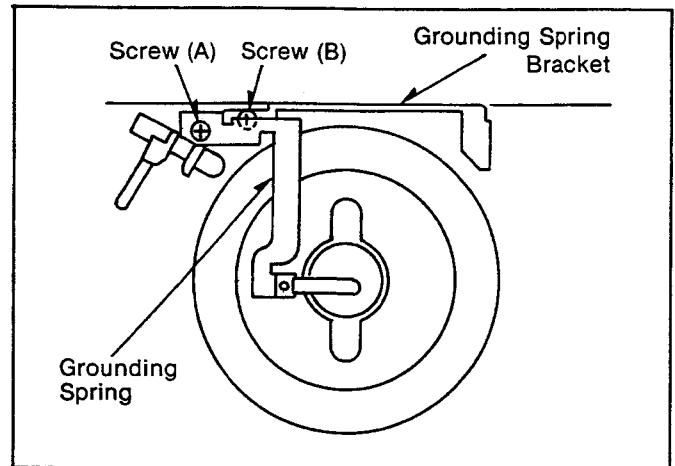


Fig. 2 Replacement of DD Cylinder Unit-(1)

2. Disconnect 2 connectors under the cylinder section.
3. Remove the 3 screws and DD cylinder unit.

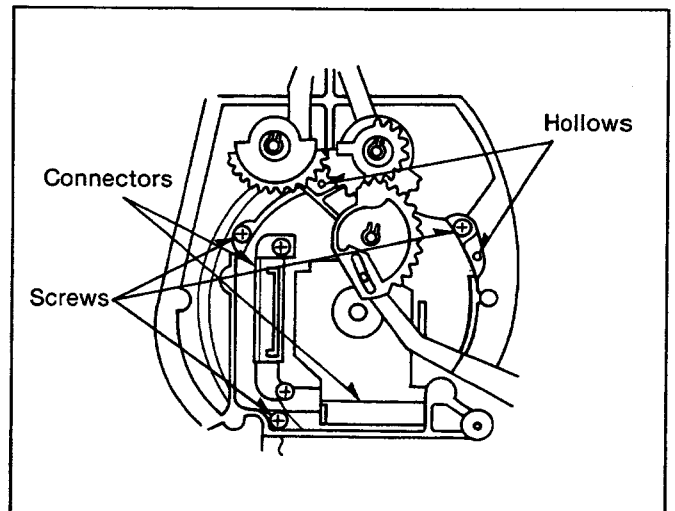


Fig. 3 Replacement of DD Cylinder Unit-(2)

Note:

Since there is very little clearance between DD cylinder unit and chassis, remove the DD cylinder unit gently and carefully.

4. Reinstall the new cylinder unit, tighten the 3 screws. Then connect 2 connectors.

Note:

Reinstall the new DD cylinder unit, so that the projections (A) on the chassis agrees with the hollows (B) under the cylinder.

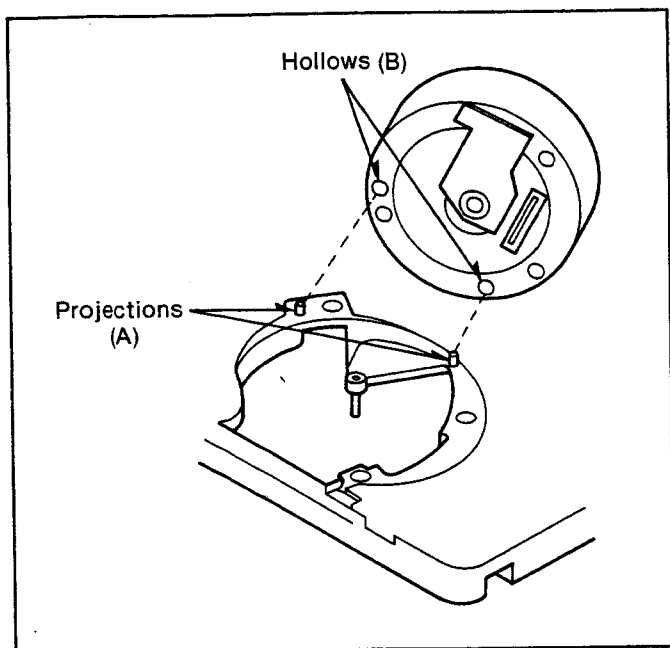


Fig. 4 Replacement of DD Cylinder Unit-(3)

Notes:

1. Gently rub the video head in direction of tape travel with Head Cleaning Stick moistened with Freon TF.
2. After replacement, confirm performance. If any further maintenance is required, perform "TAPE INTERCHANGEABILITY ADJUSTMENT".
3. After replacing the new DD cylinder unit, check to see if the Grounding Spring is correctly set in a position within 2mm to the right from the center of the cylinder shaft as shown in Fig. 5.
4. Never install the Grounding Spring to any position to left from the center of the cylinder shaft, but always within a maximum of 2mm to the right of the center of this shaft.

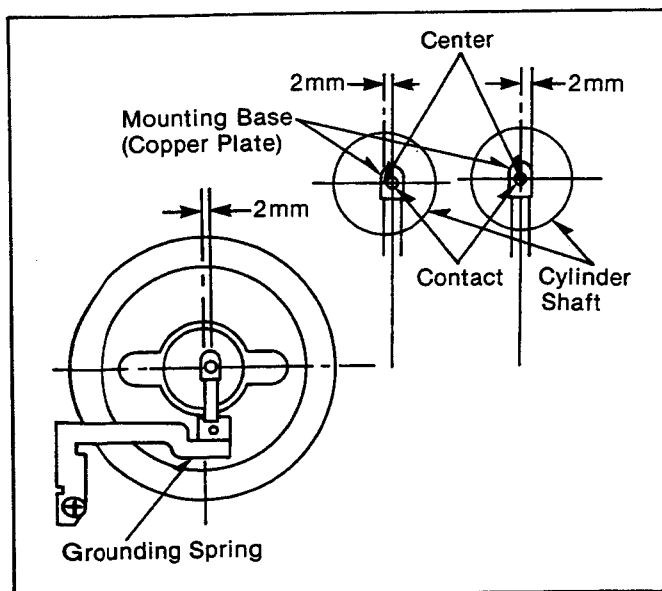


Fig. 5 Confirmation of GND Spring Installation Position

5. Do not touch Mounting Base with screws on the DD cylinder unit.

3. CONFIRMATION OF BRAKE TORQUE

*** Equipment Required:**

Dial Torque Gauge
Adaptor for Gauge

1. Attach the adaptor to the torque gauge and place the deck in STOP mode.
2. Place the torque gauge on the reel table. The weight of gauge should not rest on the reel table.

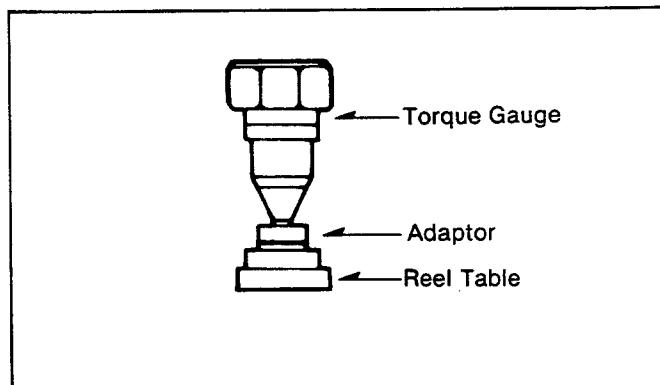


Fig. 6 Confirmation of Brake Torque-(1)

3. Turn torque gauge in either direction indicated in the Fig. 7 and read the gauge when the brake begins slipping.

Note:

If proper brake torque can not be obtained, clean the rotating surface of reel table with a soft cloth and recheck torque before replacing brake pad.

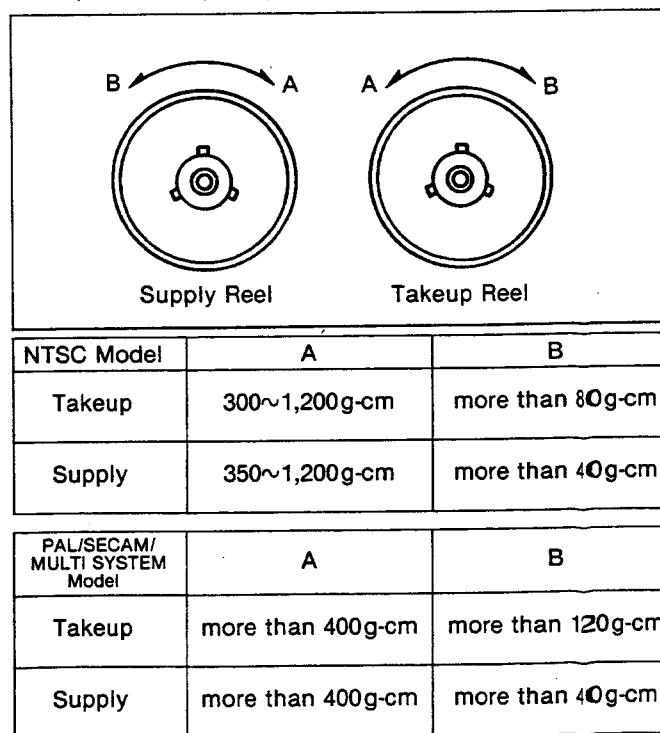


Fig. 7 Confirmation of Brake Torque-(2)

4. CONFIRMATION OF BACK TENSION

*** Equipment Required:**

Back Tension Meter
VHS Cassette Tape (120 Minutes Tape)

*** Specification:** 25~30g

1. Pull the erase head in the direction indicated by the arrow and hold it by adhesive tape.
2. Play back the cassette tape recorded in the SP mode from its beginning and wait until tape running has stabilized. (for approx. 10 to 20 seconds)
3. Insert tension meter in tape path and confirm reading.

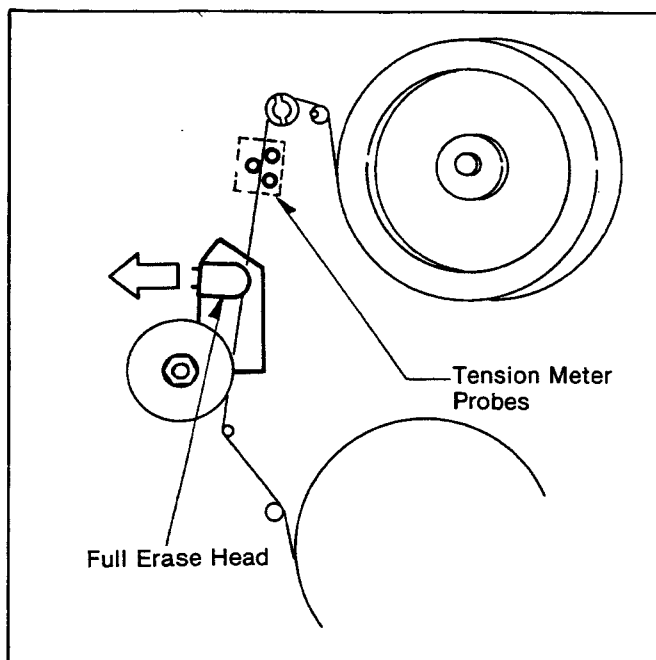


Fig. 8 Confirmation of Back Tension

Notes:

1. Make sure that the three probes of the meter are all in good contact with tape, but out of contact with any parts while measuring.
2. It is recommended to be measured three times as the tension meter is very sensitive.

5. HEIGHT ADJUSTMENT OF REEL TABLES

*** Equipment Required:**

Post Adjustment Plate
Reel Table Height Gauge

*** Specification:** 0~0.15mm

Note:

Cut-out on Post Adjustment Plate is reference of reel table height and their height is measured based on this reference.

1. Place the post adjustment plate over the reels, and put the gauge on the plate. Set the gauge to zero "0" with the foot scraper of the gauge touching the cut-out portion of the plate.

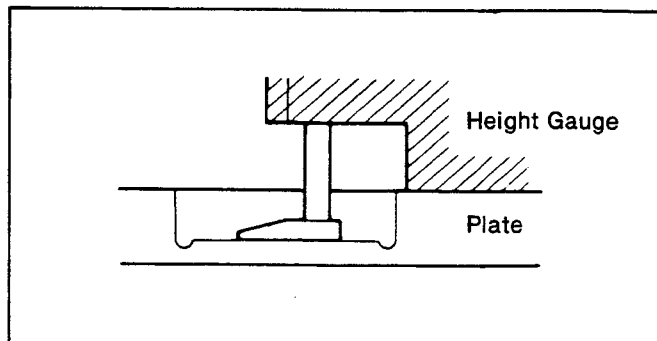


Fig. 9 Height Adjustment of Reel Tables-(1)

2. Then measure the top portion of reel table and confirm the difference just performed in former step. Do same for the other reel table.

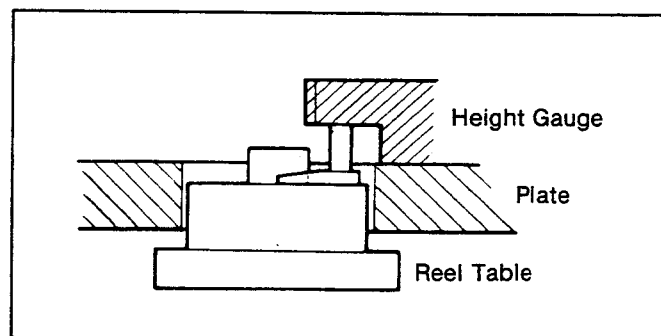


Fig. 10 Height Adjustment of Reel Tables-(2)

3. If a height difference in readings between the cut-out portion of plate and reel tables is not 0~0.15mm (higher or lower), adjust the height of the reel to obtain specified height.
4. For adjustment add or reduce a washer located under the reel table.

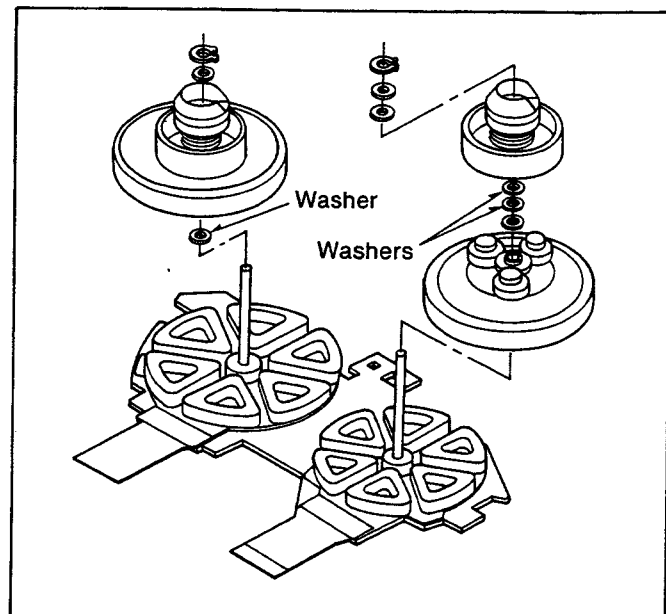


Fig. 11 Height Adjustment of Reel Tables-(3)

Note:

When adjusting the height of the tables, the DD Reel Unit needs to be removed from the chassis.
(Removal of the DD Reel Unit.)
Remove 7 screws and carefully lift it out.

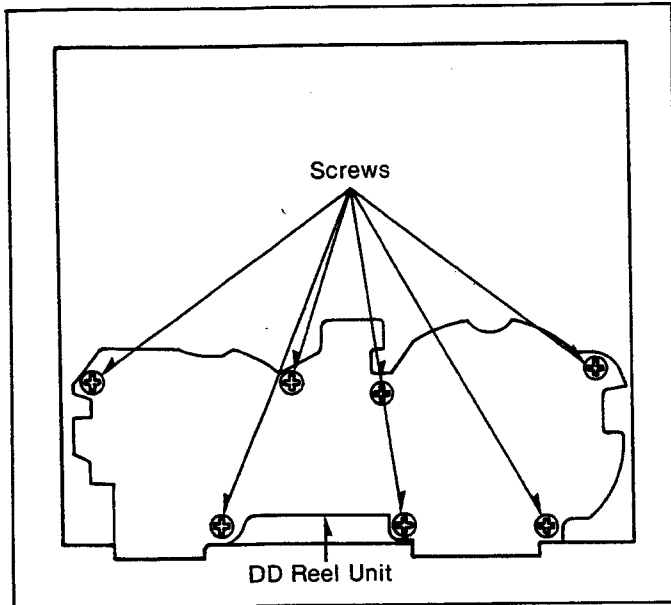


Fig. 12 Bottom View of DD Reel Unit

6. HEIGHT ADJUSTMENT OF TAPE GUIDE POSTS

*** Equipment Required:**

Hex. Wrench (0.9mm)
Post Adjustment Plate
Reel Table Height Gauge
Nut Driver (5.5mm)
Post Adjustment Screwdriver

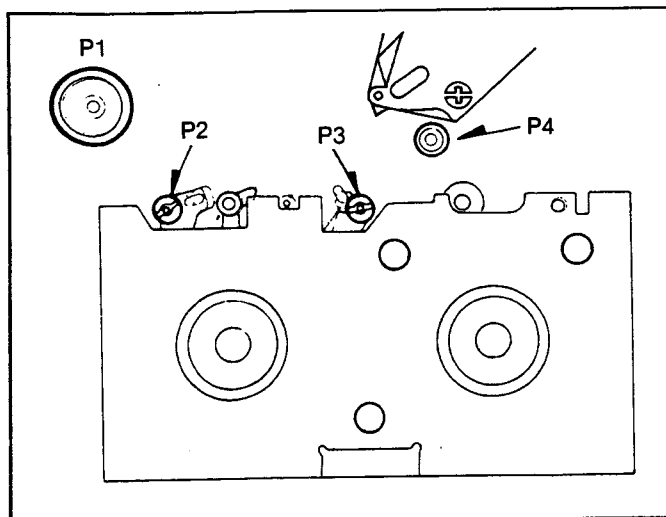


Fig. 13 Height Adjustment of Tape Guide Posts-(1)

1. First install the post adjustment plate and lower all posts if required so that they are the condition as shown.
(Lower end of post, tape guide, should be lower than foot scraper of gauge.)
Loosen a hex. screw located on the lower portion of posts (P2 & P3) then turn the top of the posts with post adjustment screwdriver.

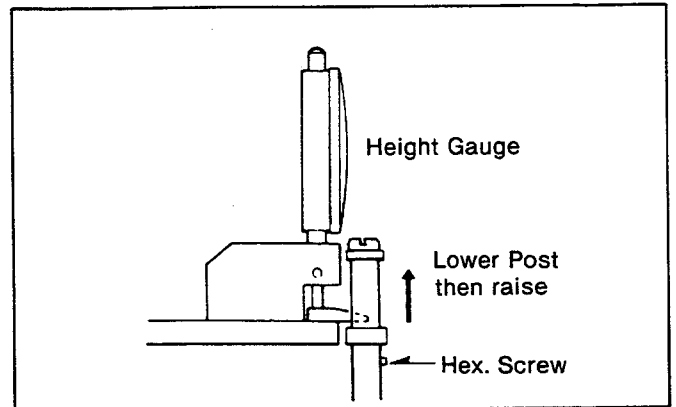


Fig. 14 Height Adjustment of Tape Guide Posts-(2)

2. Place the height gauge on the adjustment plate and place the foot scraper of gauge to the post.
(The foot scraper of gauge should be fully lowered till it touches the Post Adj. Plate.)

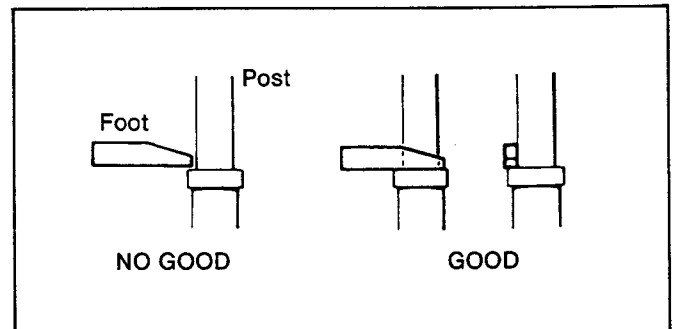


Fig. 15 Height Adjustment of Tape Guide Posts-(3)

3. Set the height gauge to zero and slowly raise the post until it just touches the foot scraper of gauge. For adjustment of P1 & P4, use the nut driver.

Note:

Upon completion of adjustment, tighten hex. screws on P2 and P3 and install the post cap on P4. When the post cap on P4 is reinstalled, orient it as shown below viewing from the direction indicated by the arrow.

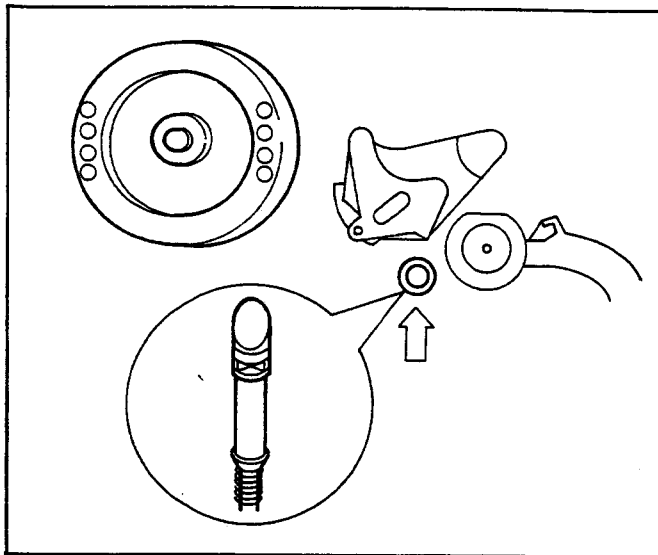


Fig. 16 Height Adjustment of Tape Guide Posts-(4)

7. HEIGHT ADJUSTMENT OF PULL OUT POST

Notes:

1. The adjustment should be performed after the adjustment of P4 as the spec. is based on height of P4.
2. The adjustment should be performed in the Loading completion mode.
3. Before this adjustment, simulate the cassette down condition without cassette tape.

(A) In Case of Front Loading Type VTR

- (1) Remove the cassette compartment. Do not disconnect the connection cable from the Cassette Loading Motor.
- (2) Insert a cassette tape into the cassette compartment.

(B) In Case of Top Loading Type VTR

- (1) Remove the cassette compartment, and cover the take up and supply photo transistors with black tape. Press the Lock Lever (B) until the cassette down condition as shown below.

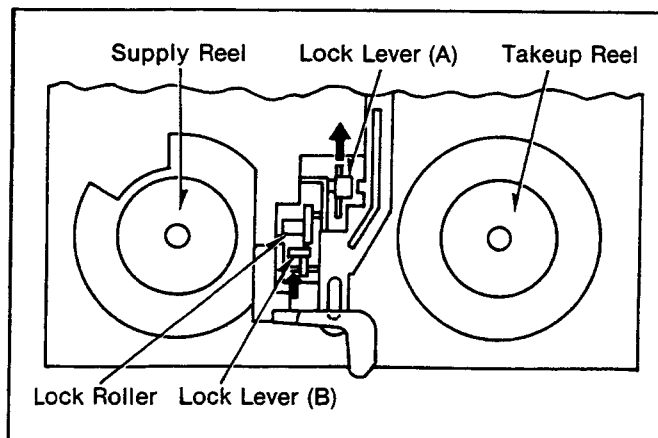


Fig. 17 Cassette Down Condition Without Cassette Tape

- (2) After this adjustment is finished, return the Lock Lever (B) to Eject position as described below.
- (3) How to return Eject position.
Pull up the Lock Roller, while Pressing the Lock Lever (A) as direction indicated by the arrow shown in Fig. 17.

* Equipment Required:

Post Adjustment Plate
Reel Table Height Gauge
Nut Drive (5.5mm), Purchase Locally

* Specification: 0mm

1. Push the play button for loading.
2. As soon as loading is completed, disconnect the AC plug and remove the cassette up holder.
3. Place the post adjustment plate, put the reel table height gauge on the plate and set height gauge to zero with condition the foot touches on the height adjustment plate.

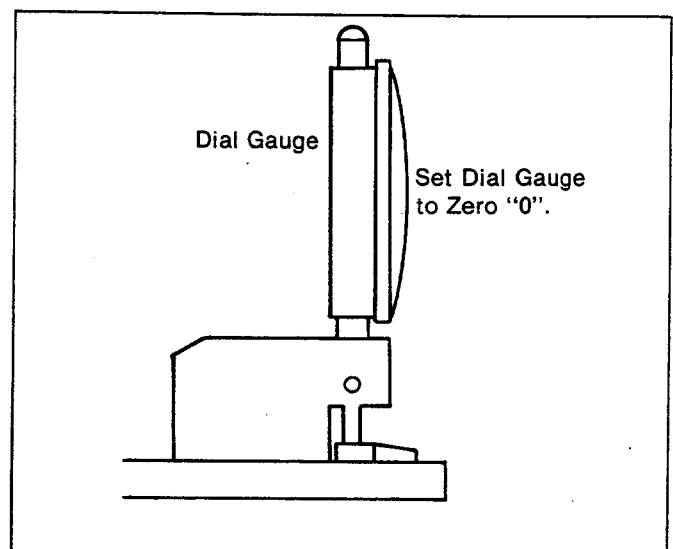


Fig. 18

4. Slightly lower the post by turning the nut clockwise. Place the foot to the post as shown.
5. Then slowly turn the nut till the gauge reads the specified height.

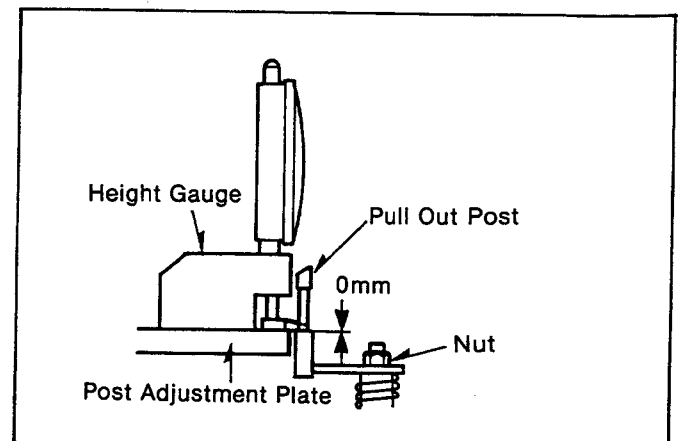


Fig. 19 Height Adjustment of Pull Out Post

6. Reinstall the cassette compartment.
7. Play back a normal cassette tape and make sure that the edges of the tape are not curling against the edge of the posts P1, P2, P3, P4 and pull out post as shown in Fig. 20.

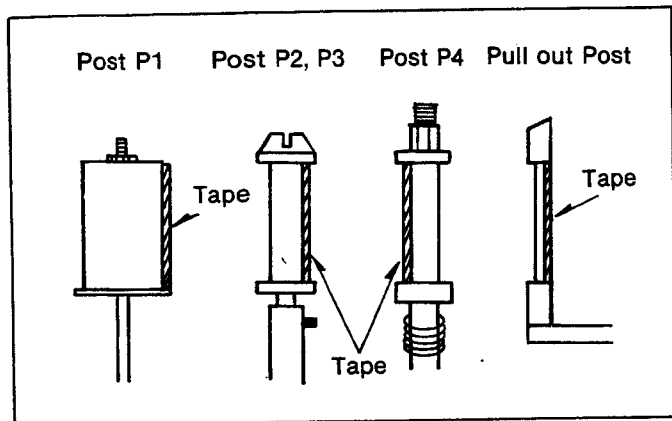


Fig. 20

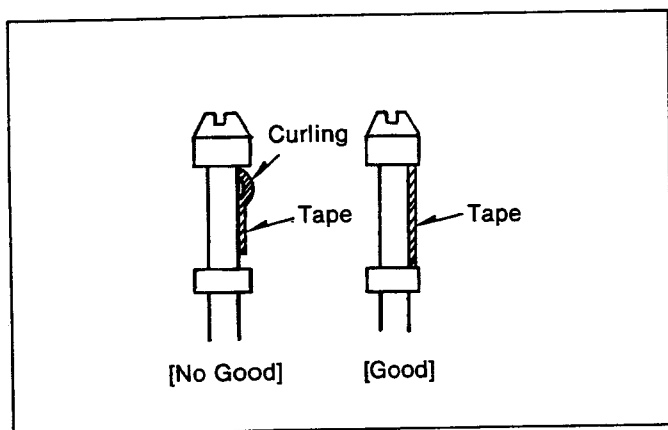


Fig. 21

8. If curling appears, readjust each post.

8. TAPE INTERCHANGEABILITY ADJUSTMENT

Note:

To perform these adjustment/confirmation procedures, make sure that the tracking control is set into the detent (fixed) position.

* Equipment Required:

Alignment Tape
Post Adjustment Screwdriver
H-Position Adjustment Screwdriver
Hex. Wrench (0.9mm)
Nut Driver (5.5mm)

8-1. Confirmation/Adjustment of Envelope Output

1. Connect the oscilloscope to the output of the Head Amp as shown below.

Note:

Head Amp output and the head switching pulse input for triggering the oscilloscope are shown in the Luminance Process Block Diagram of the VTR Service Manual.

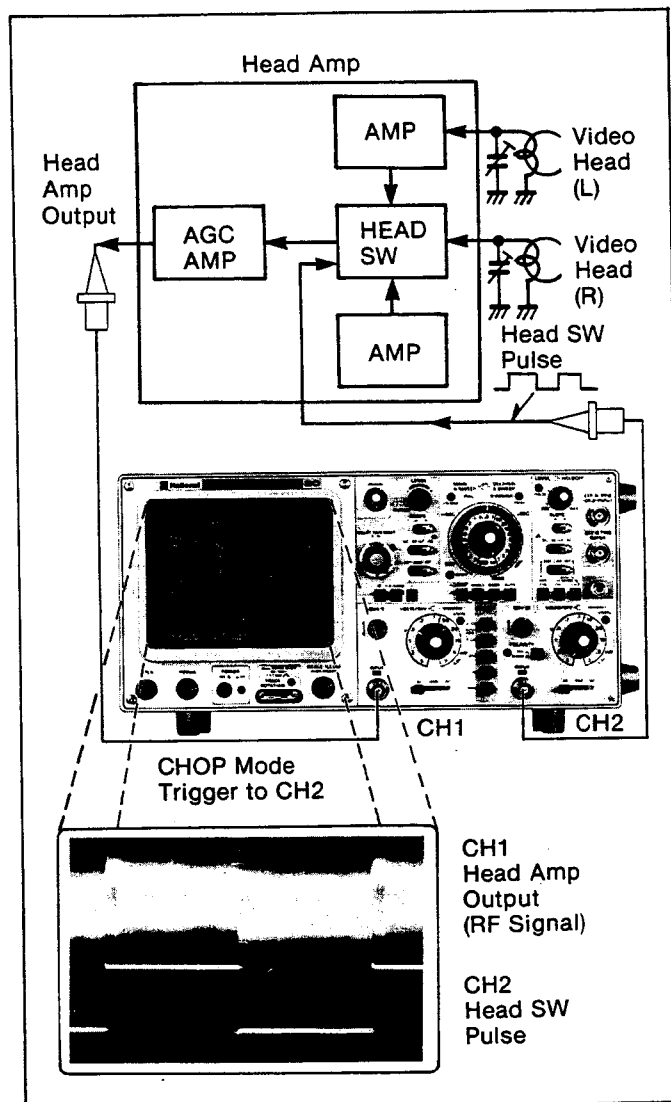


Fig. 22 Connection of Oscilloscope

2. Playback the monoscope portion of the alignment tape and adjust posts P2 and P3 while watching the scope display so that RF envelope on the scope becomes as flat as possible.

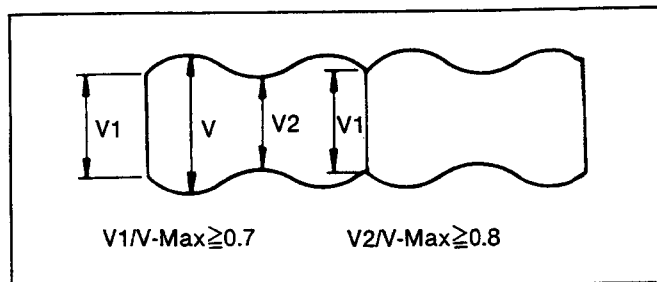


Fig. 23 Confirmation of Envelope Output

3. If the scope display is as follows, adjust the height of P2 shown in Fig. 13.

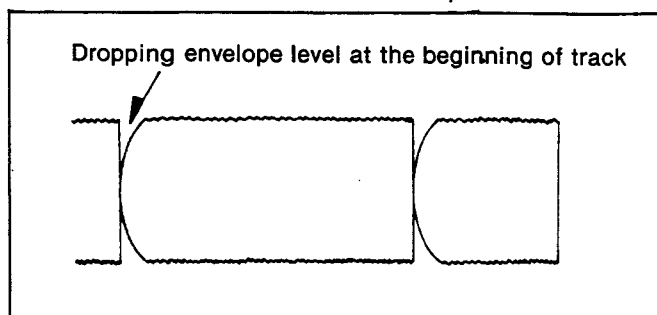


Fig. 24 Adjustment of Envelope Output-(1)

4. If the scope display is as follows, adjust the height of P3 shown in Fig. 13.

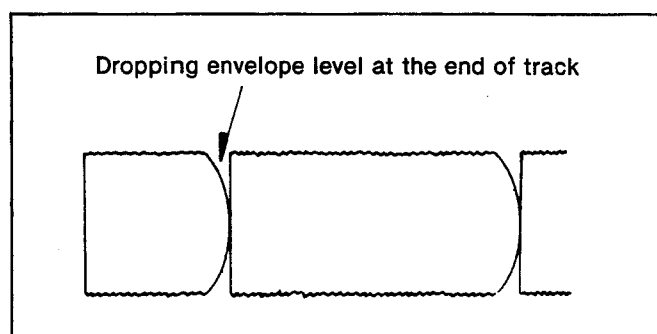


Fig. 25 Adjustment of Envelope Output-(2)

5. When P2 and P3 posts are adjusted correctly the scope display becomes as shown below.

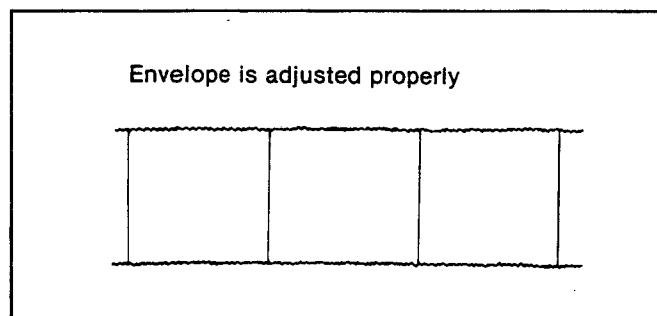


Fig. 26 Adjustment of Envelope Output-(3)

6. When adjustment is required, turn slowly and wait for servo lock. Be sure the tape travels over the post as shown.

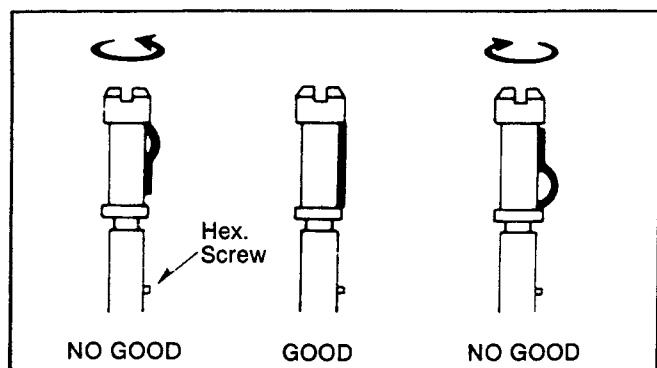


Fig. 27 Adjustment of Envelope Output-(4)

8-2. Confirmation of A/C Head Height

Note:

Unless the A/C Head is replaced, this procedure should not be performed.

1. Looking at the lower edge of the control head with the tape running, ensure that the lower edge of the tape runs along the lower edge of the control head. If it doesn't, slightly turn the nut (A) in either direction to correct. Clockwise to lower the head and counterclockwise to raise it.

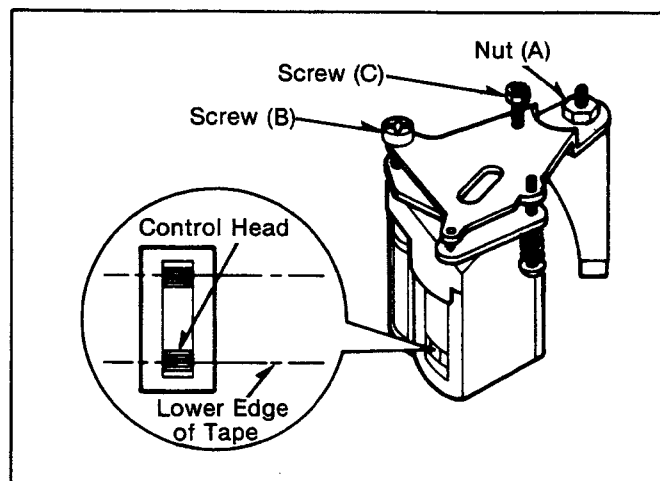


Fig. 28 Confirmation of A/C Head Height

8-3. Confirmation of Tilt of A/C Head

This procedure should be performed after the height adjustment of P4.

1. Play back the tape and confirm the tape runs between lower and top limiters of post. And confirm the condition of tape running.
2. If the adjustment is required, turn counterclockwise the screw (C) so that the curling is apparent with lower edge of P4. Then turn clockwise the screw (C) so that the curling is smooth out.

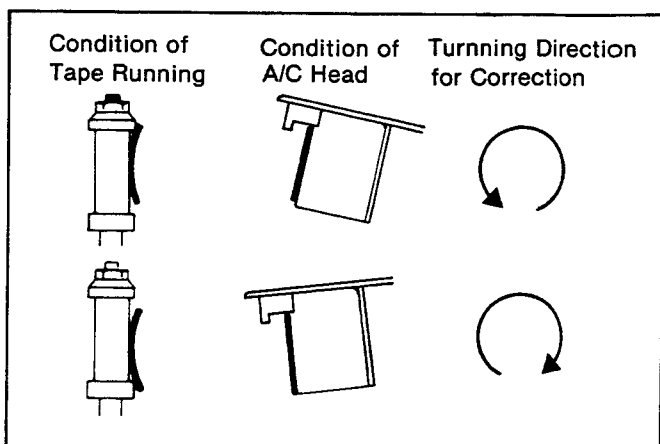


Fig. 29 Confirmation of Tilt of A/C Head

8-4. Adjustment of A/C Head Height and Azimuth

(A) Procedure for Mono A/C Head

1. Connect the oscilloscope to the Audio Output on the right side of the deck.
2. Play back the monoscope portion (6kHz, Mono) of the alignment tape.

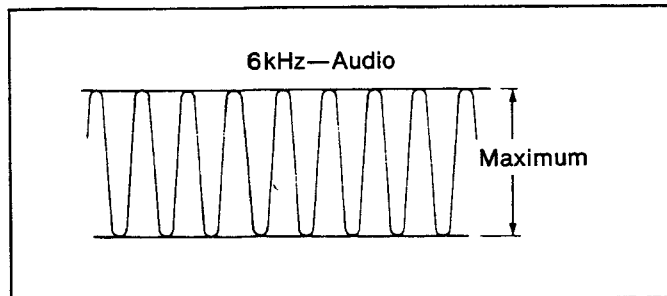


Fig. 30 Adjustment of A/C Head Height and Azimuth

3. Adjust the screw (B) on the head base so the output level becomes maximum.

(B) Procedure for Stereo A/C Head

1. Set the Audio Select Switch to L + R position.
2. Connect the Audio Connection Cable to the Audio Output on the right side of the deck.
3. Connect the oscilloscope CH1 to the Audio Connection Cable (Left), and CH2 to the Audio Connection Cable (Right).
4. Playback the color bar portion (Stereo) of the alignment tape.
5. Adjust the screw (B) so that the CH2 envelope is maximized.

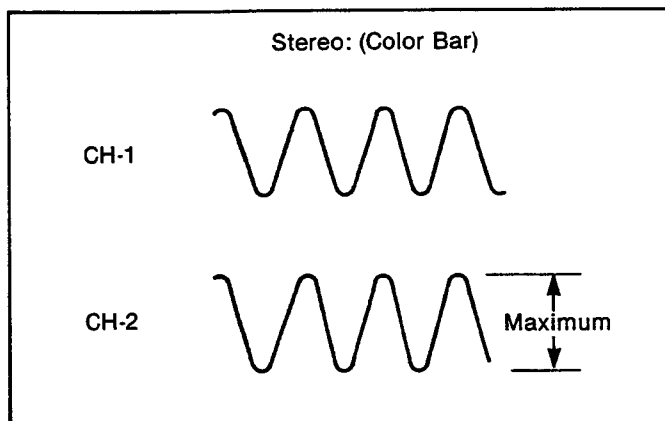


Fig. 31 Adjustment of A/C Head Height and Azimuth-(1)

6. Then, adjust the nut (A) so that the CH2 envelope is maximized.

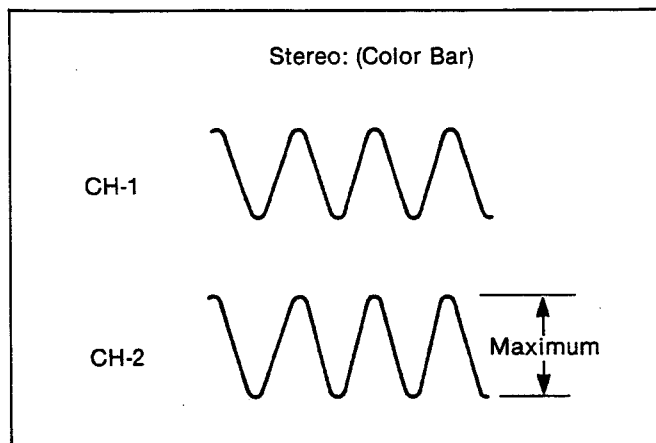


Fig. 32 Adjustment of A/C Head Height and Azimuth-(2)

7. Playback the monoscope portion (6kHz, Monaural) of the alignment tape.
8. Then, adjust the screw (B) so that the phases of the both channels are matches as shown below.

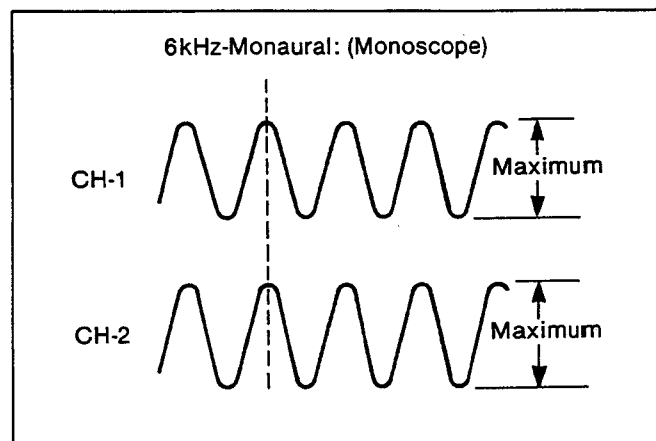


Fig. 33 Adjustment of A/C Head Height and Azimuth-(3)

Note:

During this adjustment, the audio output level should be maximum.

8-5. Horizontal Position Adjustment of A/C Head

1. Set the tracking control to the detent (fixed) portion. Connect the oscilloscope to the output of the Head Amp. Refer to Fig. 22 "Connection of oscilloscope".
2. Playback the monoscope portion of the alignment tape and confirm the RF signal envelope figure.
3. If adjustment is required, insert an H-position adjustment screwdriver into the Adjustment Nut.
4. Slowly turn the Adjustment Nut clockwise until the envelope output is maximized.

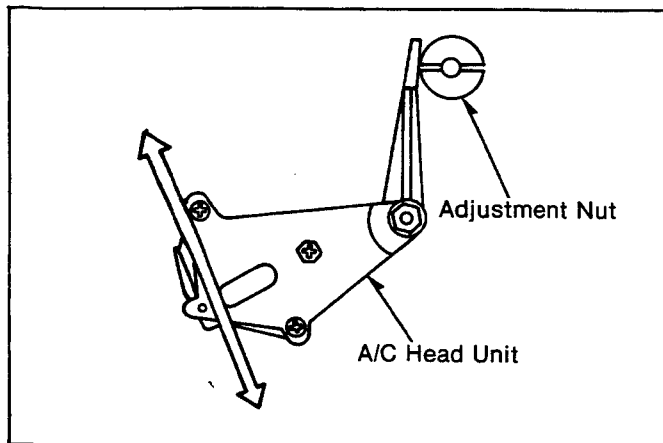


Fig. 34 Horizontal Position Adjustment of A/C Head

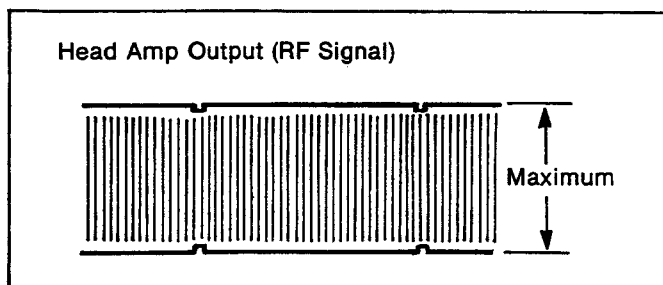


Fig. 35

9. ADJUSTMENT OF F.G. HEAD GAP

* Specification: $0.18 (\pm 0.02)\text{mm}$

1. Slightly loosen the 2 screws.
2. Hold the F.G. Head Unit with your fingers, and adjust the gap as specified.
3. After adjustment, tighten 2 screws.

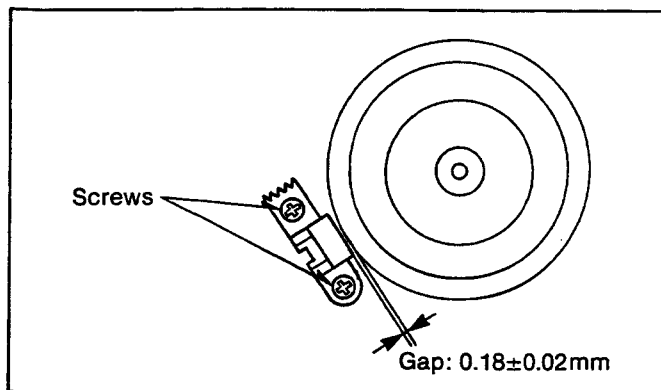


Fig. 36 Adjustment of FG. Head Gap

Note:

Do not flaw the F.G. Head or outside surface of the rotor.

10. ASSEMBLY AND ADJUSTMENT OF GEARS AND ROD

GENERAL CONDITION

The mechanism of this model is mostly engaged to the System Control Circuit, through the mode select switch.

Therefore the relation between the mode select switch and the cam gear decides all further mechanical movement of the mechanical parts such as levers, gears, rollers and so on.

If the adjustment of this item is performed improperly, the deck will be unloaded or compulsorily stopped.

And it will result being damaged at any mechanical or electrical parts.

A. ADJUSTMENT OF LOADING ARM

1. Install the supply and takeup loading arm units so that the projection (A) on the takeup loading gear aligns with the projection (B) on the supply loading gear. Then install the 2 retaining rings on the supply loading gear and on the takeup loading gear. Ensure that the loading arm units are still in the fully unloading condition.

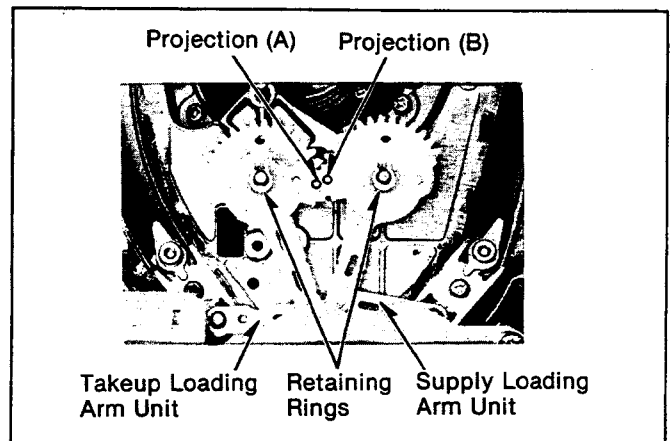


Fig. 37 Assembly and Adjustment of Gears and Rod-(1)

Note:

Pay attention that the washers are remaining under the loading gears.

B. ADJUSTMENT OF CAM GEAR

1. Make sure the position of Loading Arm as Fig. 38 before proceduring this adjustment.
2. Install the cam gear so that the hole on the cam gear meets the hole on the chassis. Then install the retaining ring.

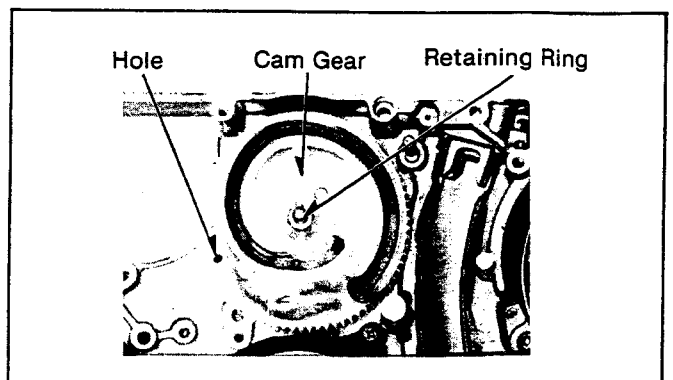


Fig. 38 Assembly and Adjustment of Gears and Rod-(2)

3. Install the lock arm as shown in Fig. 39. Then install the retaining ring and the washer.

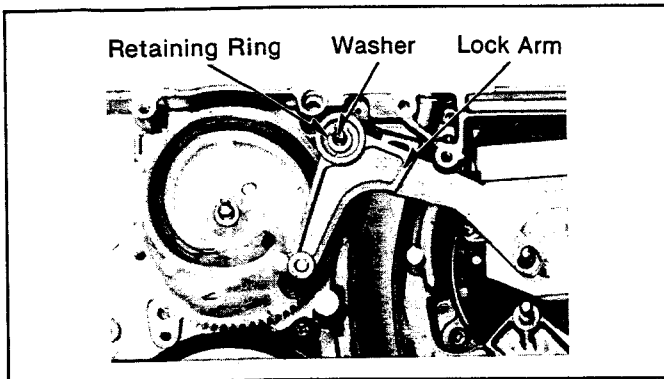


Fig. 39 Assembly and Adjustment of Gears and Rod-(3)

Note:

Pay attention that the washer is remaining under the lock arm.

C. ADJUSTMENT OF LOCK GEAR

1. Perform the adjustment after making sure the mechanism position that is described in previous item A and B.
2. Install the lock gear so that the projection (C) on the lock gear aligns with the projection (D) on the takeup loading gear.

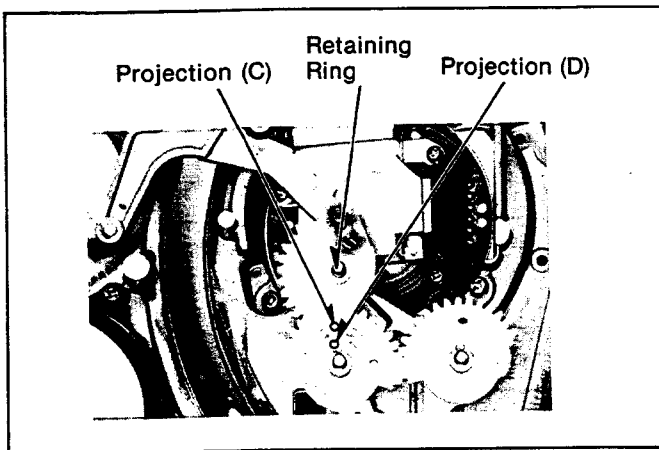


Fig. 40 Assembly and Adjustment of Gears and Rod-(4)

3. Install the support plate with the screw.

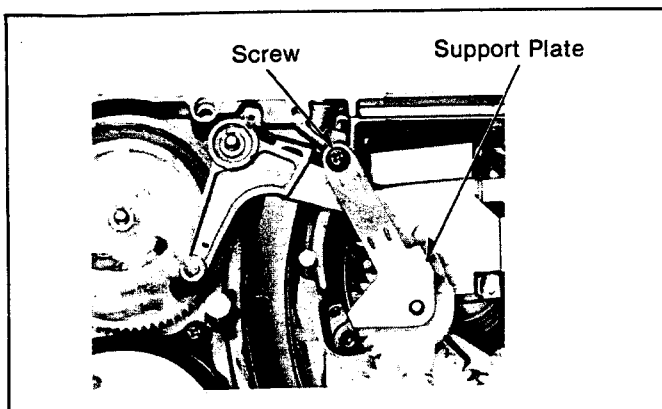


Fig. 41 Assembly and Adjustment of Gears and Rod-(5)

D. ADJUSTMENT OF MODE SELECT SWITCH

1. Perform this adjustment after making sure the mechanism position that is described in previous item A, B and C.
2. Rotate the gear on the mode select switch so that it is in click (dentent) position. Then install the mode select switch so that the delta hole (E) on the rotary switch gear aligns with the projection (F) on the cam gear, and install the 2 screws.

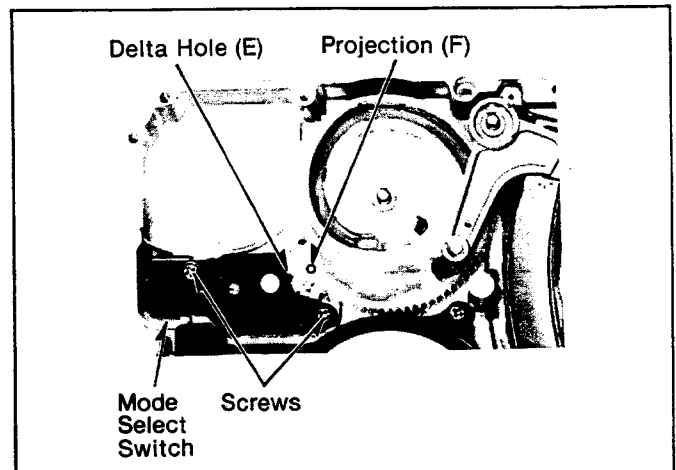


Fig. 42 Assembly and Adjustment of Gears and Rod-(6)

Note:

There is one click point per 4 rotations.

3. Install the loading motor with 2 screws.

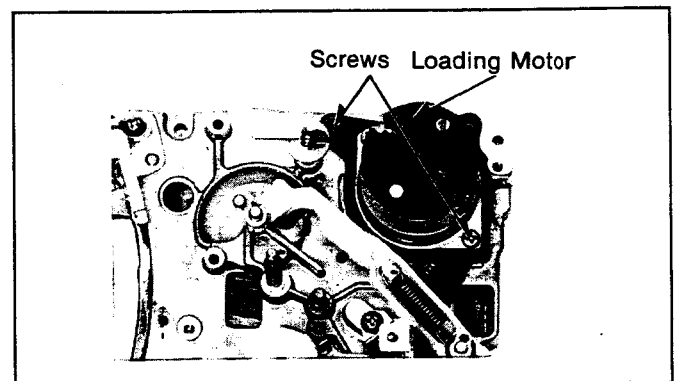


Fig. 43 Assembly and Adjustment of Gears and Rod-(7)

4. Confirm the cam gear is in the EJECT condition.

E. ASSEMBLY PROCEDURE OF MAIN ROD, BRAKE ARM, BRAKE CAM GEAR

1. Perform the assembly after making sure the mechanism position that is described in previous item A, B, C, and D.
2. Install the main rod so that the hole on the main rod meets the hole on the chassis. Then install the brake arm, the brake cam gear, the washer and the 3 retaining rings.

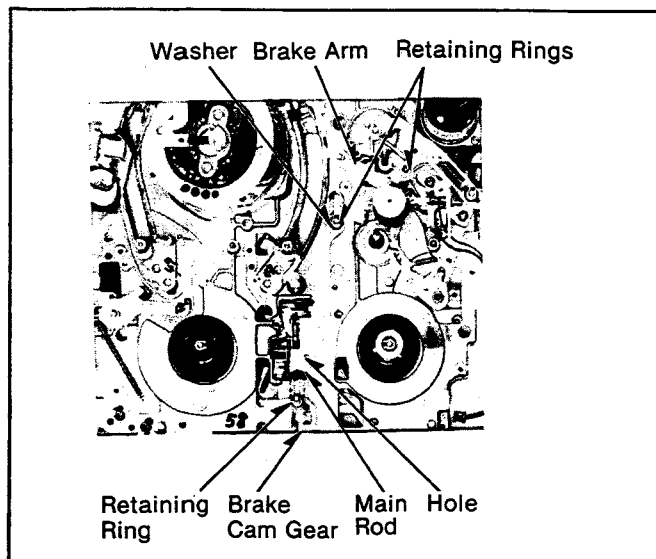


Fig. 44 Assembly and Adjustment of Gears and Rod(8)

11. ADJUSTMENT OF LEAF SWITCH

Note:

This adjustment for Top Loading VTR.

* Equipment Required:

Fine Adjustment Screwdriver

* Specification: 0.9mm~1.3mm

1. Remove the DD Reel Unit from the chassis.
2. Slightly loosen a screw (A) and insert the Fine Adjustment Screwdriver to the Hole (B).
3. By rotating the Fine Adjustment Screwdriver, adjust the leaf switch so that gap (C) is 0 and the gap (D) between the upper and lower plates of the leaf switch is 0.9mm to 1.3mm, and tighten screw (A).
4. Install the DD Reel Unit.

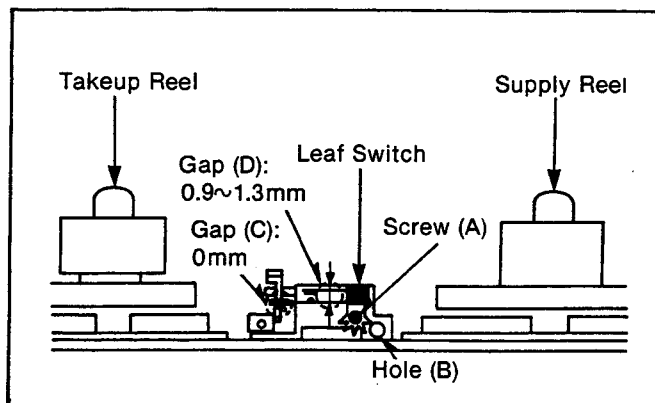


Fig. 45 Adjustment of Leaf Switch

Note:

After adjustment, confirm that the leaf switch turns On when the Cassette Up Unit is pressed down, and turns Off when the Cassette Up Unit is raised.

12. POSITION ADJUSTMENT OF RECORDING SAFETY SWITCH

Note:

This adjustment for Top Loading VTR.

* Equipment Required:

Cassette Holder Fixture

Fine Adjustment Screwdriver

1. Place the fixture in place over the reel tables.
2. Confirm Rec. Safety Switch position is just turned ON.
3. When Rec. Safety Switch position is not right, remove the fixture and loosen a screw (A).
4. Insert the fine adjustment screwdriver into the hole (B), and adjust the position. Then tighten the screw (A).
5. Reinstall the fixture and confirm again.

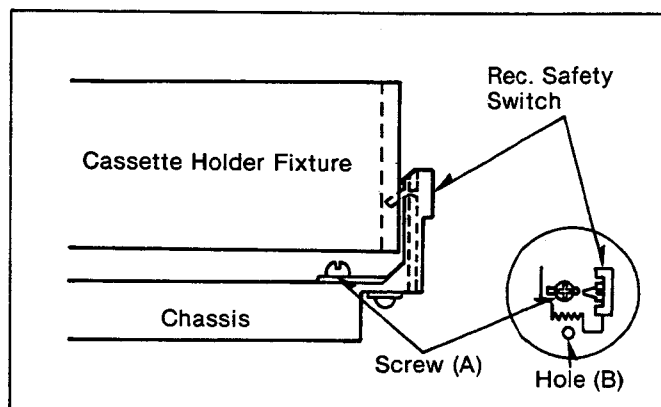


Fig. 46 Position Adjustment of Recording Safety Switch-(1)

Note:

When cassette with a safety tab is used, the Rec Safety switch Turns on and without a tab, it opens.

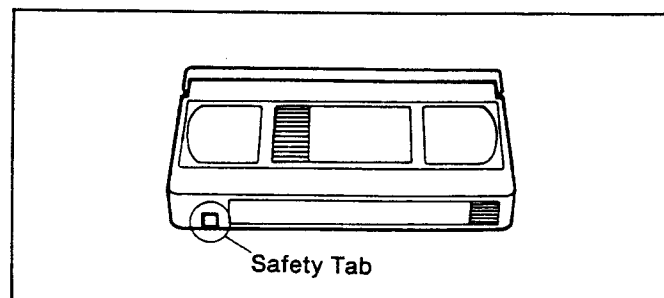
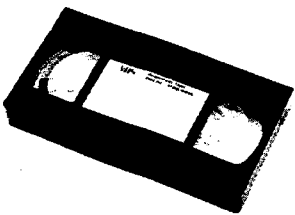
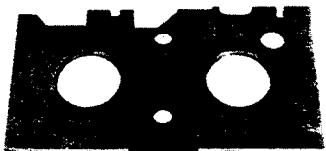
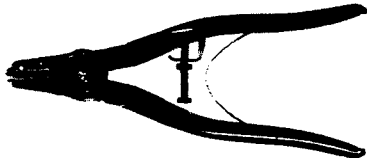
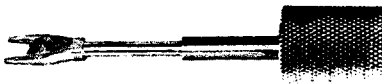
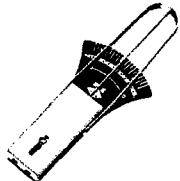
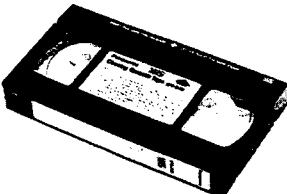


Fig. 47 Position Adjustment of Recording Safety Switch-(2)

Servicing Fixtures & Tools

VFJ8125H3F VHS Alignment Tape 	VFK0191 Post Adjustment Plate 	VFK0188 Cassette Holder Fixture 
Back Tension Meter (Tentelometer, Made in U.S.A.) 	VFK0144 Retaining Ring Remover (3mm) 	VFK0189 H-Position Adj. Fixture 
VFK0133 Dial Torque Gauge VFK0134 Adaptor for VFK0133 VFK0180 (Plastic Clamper Only) 	VFK0146 Hex. Wrench (0.9mm) 	VFK0190 Reel Table Height Jig 
VFK0136 Fine Adjustment Screwdriver  Approx. 1.5mm. Grind the top portion approximately 2.5mm.	VFK0225 Head Tester 	VFK66 Fan Type Tension Gauge 
VFK0137 Post Adjustment Screwdriver 	VFK0185 Cleaning Cassette Tape 	MOR265 Morlytone Grease 
VFK27 Head Cleaning Stick 